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3/30/44

Dr. Martin:

You will note that some of the acreage figures for the work on the White National Forest in Part IV of this report do not agree with those given in Table 27 in the Appendix. This is due to the fact that we recently received revised figures from Mr. Boomer for the 1943 work and the net control area on the White Mountain National Forest. Part IV of our report was revised accordingly, but it did not appear advisable to make adjustments in the remainder of the report which was practically completed when we received the revised data from Mr. Boomer.

K. K. Stimson
Associate Plant Pathological Inspector
Plant Disease Control

WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1943

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WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1943

FOREWORD

This report summarizes blister rust control accomplishments in the Northeastern Region during the calendar year 1943 on the basis of the following uniform financial and work projects:

Bureau of Entomology and Plant Quarantine

Work Projects: BLR-1-1, Leadership, coordination and technical direction of white pine blister rust control in Northeastern Region.

BLR-3-1, Cooperative blister rust control on state and privately-owned lands in Northeastern Region.

Forest Service

Financial Project: BLR-4, Blister rust control on National Forests.

Department of Interior

Financial Project: BLR-5, Blister rust control on National Parks.

In addition to the current year's activities, this report also summarizes accumulative results for the period 1918 to 1943, inclusive, and shows the present status of various phases of control work such as ribes eradication, detail mapping of control areas, nursery sanitation, and Ribes nigrum elimination.

PART I

GENERAL STATEMENTImportance of White Pine in The Region

The economic importance of white pine continues to be emphasized as a result of the stupendous demand for white pine lumber in connection with the war effort. Figures compiled by the War Production Board for 1943 show a nation-wide production of 1,009,466 M. board feet of eastern white pine lumber as compared with 790,651 M. board feet in 1940, a comparative increase of 27.7%. Due to the exigencies of the shipping situation, a large percentage (99.1) of the total production in 1943 was used for boxing and crating. This use pattern is not truly representative of the economic significance of the species because in normal times much of the lumber would be suited to higher types of uses.

The extent to which pine owners in the Northeastern States are responding to the all-out lumber production effort is reflected in the figures for the total cut for 1942 as compiled by the Bureau of The Census, U. S. Department of Commerce. In that year, the total cut in the nine Northeastern States amounted to 777,550 M. board feet. This constituted 71.8% of the total production of eastern white pine and 42.8% of all white pine lumber produced in the United States that year. On the basis of average stumpage and log prices in the several states, the total stumpage value of the cut in the Northeastern Region is estimated at \$4,753,884 and the total value on the basis of log prices amounted to \$13,582,194. Based on average prices at the mill, the white pine lumber produced in the Northeastern Region during 1942 had a total value of \$23,258,617.

Heavy cutting of white pine continued during 1943 at an accelerated rate. Reports from all states indicate a creditable response to the urge of the War Production Board for the cutting of merchantable white pine. Areas which escaped the devastation of the 1938 hurricane are now being logged to meet the increased demands. In this connection, efforts are being made by representatives of federal and state forestry agencies to avoid practices that will jeopardize the immature trees that are so important to a permanent lumber supply.

Blister rust control is an integral part of the protective measures that are imperative to the preservation of white pine as an all-important natural resource of the region. The heavy cutting during recent years merely emphasizes the importance of adequately protecting the remaining supply, especially the young growth which is most seriously damaged by blister rust. Under the present program in the Northeast, control is being practiced on a permanent control area of 12,709,748 acres involving 4,262,034 acres of white pine. This pine acreage comprises stands of adequate vigor which meet stocking requirements based upon an expectancy of at least 50 crop trees per acre at maturity. In addition, thousands of acres of merchantable white pine have been discontinued from the control area because little pine reproduction was present or expected on these areas and appreciable damage from blister rust should not occur prior to logging. There are also several hundred thousand acres of white pine which have been eliminated from the control area due to insufficient pine stocking, poor quality, excessive cost of control, too much infection, or because the total amount of pine in a township was not sufficient to justify public expenditures for control work.

It is estimated that the total white pine forests in the Northeastern Region (pure stands and mixed stands containing 20-79 percent white pine) comprise approximately five and a quarter million acres. Over 99 percent of this pine is in state and private ownership, chiefly farm wood lots.

Eastern white pine is also very important from a scenic and recreational viewpoint, as it adds immeasurably to the attractiveness of the region which is fast becoming one of the principal year around playgrounds of America. Before the war, the value of the tourist business in New England alone was estimated at 400 million dollars per year. In addition, white pine has a high value for watershed protection and has been planted extensively for that purpose as well as commercial reforestation.

Blister Rust Infection on Pine

Blister rust infection has been reported on white pine throughout the region, except in 16 Pennsylvania counties, five non-pine counties in New Jersey, and four New York counties, the latter comprising the metropolitan area of New York City. Over extensive areas from 1 to 20 percent of the pines are infected; and in numerous local tracts, from 30 to 90 percent of the trees are diseased, many in a dead or dying condition. The amount of infection varies considerably in different localities and is influenced by the number of original infection centers caused by the planting of imported diseased pine, the distribution and amount of pine, association of pine and ribes, climatic conditions, and the application of control measures. Pine infection is most severe in Essex and Warren Counties in New York, the upper Connecticut River Valley region in New Hampshire and Vermont, and in most sections of Maine, outside of Cumberland and York Counties. In these portions of the Northeastern Region damage to commercial size trees is very noticeable and lumbermen are now commenting on the number of broken-off tops, dead and dying trees. In southern New England and in most of the southern and western portions of New York, pine infection is relatively light, except in limited areas. Due to fewer plantations of imported diseased stock and the localization of native white pine areas, there has been a relatively slow spread of blister rust infection in New Jersey and Pennsylvania. However, in the latter state, numerous large ribes are encountered in many sections and in unprotected areas a rapid intensification of the disease results once it becomes established.

General observations and field surveys during recent years indicate that in areas where ribes have been effectively eradicated very few recent pine infections can be found although many old cankers which developed prior to control measures may be present. On the other hand, the amount of pine infection has continued to increase in most unprotected tracts. For example, a study during 1943 of pine reproduction in an unprotected area in West Rutland, Vermont, indicated that 10 percent of the pines were infected and all but seven percent of the blister rust cankers originated during the period 1938 to 1941, chiefly in 1940. Heavy blister rust damage to merchantable size pine was also reported during 1943 in the towns of Brighton and Rockport, Maine.

Chart I shows the botanical range of white pine, boundary of the present net control area, and the distribution by counties of blister rust infection on native white pine in the Northeastern Region.

CHART NO. I - WHITE PINE BLISTER RUST CONTROL NORTHEASTERN REGION - 1943

LEGEND

- Control area
- White pine in control area
- White pine outside control area
- Distribution of Blister Rust on pine
- Regional Headquarters
- State offices



Scale of Miles

0 20 40 60 80 100

Blister Rust Infection During 1943

Aecial production during 1943 did not differ conspicuously from that of recent years. Ribes were quite generally infected throughout the region, indicating the continued source of an ample supply of inoculum. According to U. S. Weather Bureau reports, precipitation during the 1943 growing season was somewhat below the mean for the past 56 years in southern New England, while in the northern portion it was well above the mean. In New York, the precipitation was about normal during the growing season of 1943.

Evidence of pine infection of recent origin continues to be rather meagre, except in a few instances, even in some unprotected areas and tracts where no control work has been performed in several years. Unfavorable weather during the critical period from July 15 to September 15 was probably the chief factor in limiting the amount of new pine infections. According to Hielke, "The character of the moist period is highly important. - - - The weather conditions considered by Spaulding and Gravatt (1925) as presumably favorable for rather heavy infection of pines begin with rain, which should end quite abruptly after 7 hours and should be followed by about 23 hours of cloudy weather and right conditions. - - - If the rain continues too long the sporidia are carried down by the falling drops and thus rendered innocuous to the pines. Very gentle rains or mists evidently are relatively much more favorable to pine infection than are heavy rains. - - - It should be evident that in general precipitation records alone are of relatively little value in the determination of seasons that have been favorable to pine infection, because they afford little indication of the character and duration of highly humid periods". Another important factor in preventing new pine infections is the application of control measures on over 85 percent of the control area in the Northeastern States. Observations also indicate that most ribes in the open have thick leathery leaves and that infection is slight or absent on such bushes.

Control Activities During 1943

All blister rust control activities during 1943 in the Northeastern States were conducted under the Regular Cooperative Program except in New York and Pennsylvania where a few W.P.A. employees were assigned to mapping and blister rust canker elimination work during January. Work on federal lands was restricted to Acadia National Park and the White Mountain National Forest where projects were operated in cooperation with the National Park Service and U. S. Forest Service.

The 1943 ribes eradication work resulted in 363,727 acres being cleared of 2,574,503 wild and cultivated ribes. This acreage is only about 25% less than was examined during the preceding year, and is very commendable considering war conditions. Sanitation work was performed in the environs of 13 nurseries in three states during 1943. Only 620 wild and cultivated bushes were located and destroyed on the 6,892 acres examined, all but 100 acres of which was re-eradication work. There were 35,326,800 white pines in the 13 nurseries protected this year.

There was a big decrease in the volume of control area mapping work during 1943 as only a few laborers were available for such activities. However, a total

of 49,474 acres was mapped in detail in seven of the states. About 75 percent of this mapping work was performed by the district leaders during the fall and winter months.

No special black currant elimination work was conducted during 1943 and blister rust canker elimination work was restricted to small projects on public lands in two states.

Status of Control Area Mapping

Detail mapping of white pine areas and protection zones is an important phase of blister rust control. Such maps are not only of assistance to the crew foremen on ribes eradication work, but are essential in planning and executing future re-examinations of control areas. During the early years of the control program in this region, very little pre-eradication survey work was performed chiefly due to lack of funds for such activities and because the district leaders had to confine their fall and winter activities to informational and service work to secure local cooperation in applying control measures. However, the Emergency Programs during the period 1933-1942 were of great assistance in providing men to do this important detail mapping. At the end of 1943, detail mapping had been completed on 8,392,834 acres, or 66.0% of the total net control area aggregating 12,709,748 acres. Such mapping work has been completed in Connecticut and is 96.4% complete in Vermont. The unmapped acreage in the net control area totals 4,316,914 acres, of which 61.8%, or 2,669,781 acres, is in the States of New Hampshire and Massachusetts. Most of the areas which have not been detailed mapped in these two states as well as other states in the region were initially cleared of ribes prior to 1933 at which time spot maps were prepared, usually on U.S.G.S. sheets, to show the location of pine and the boundaries of the control areas.

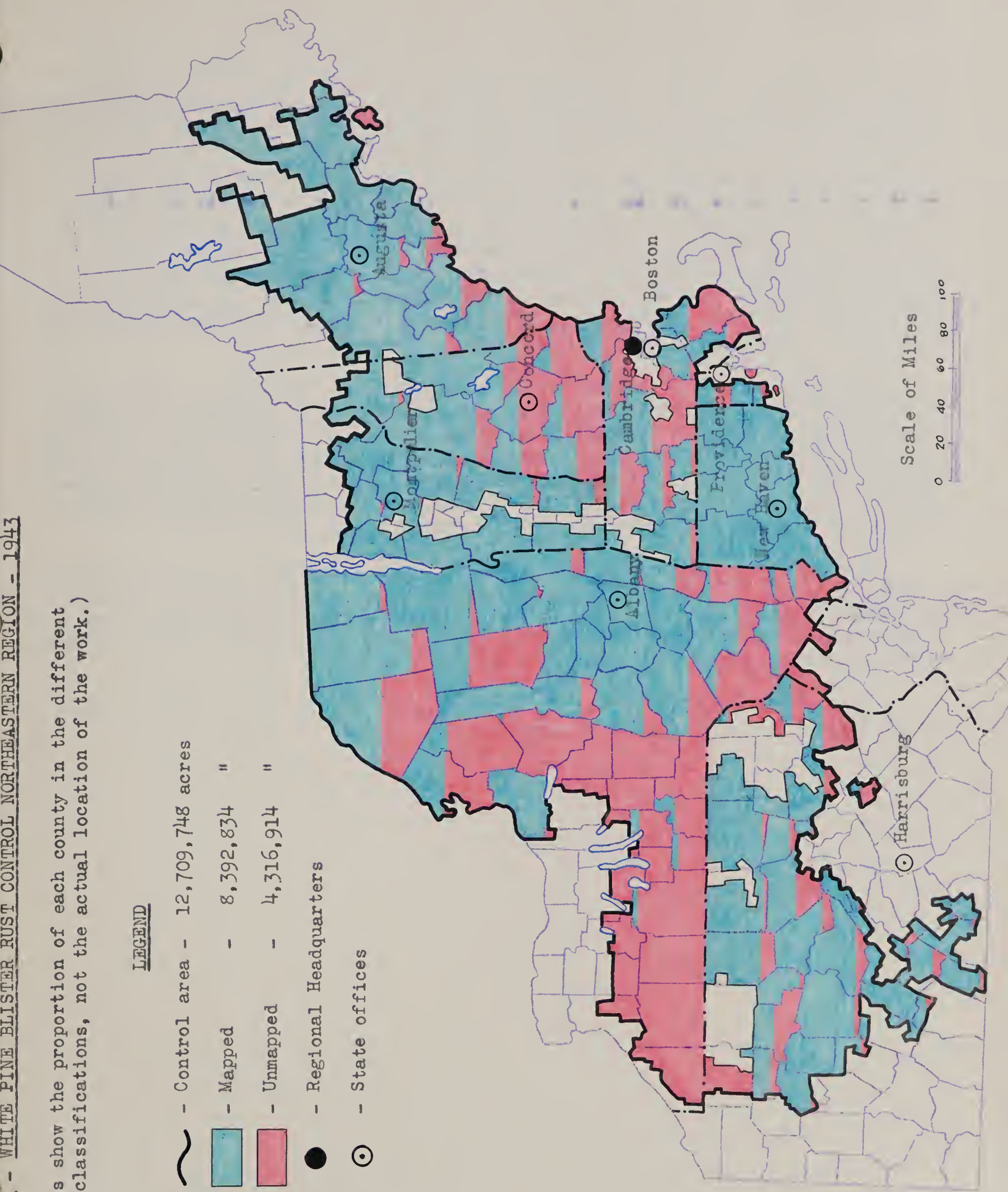
Chart No. II shows the percentage of the present net control area that has been detail mapped in each county in the Northeastern Region. In the Pennsylvania counties shown as partly completed, most of the pine areas have been mapped in detail, but not the protection zones.

CHART NO. II - WHITE PINE BLISTER RUST CONTROL NORTHEASTERN REGION - 1943

(Colors show the proportion of each county in the different work classifications, not the actual location of the work.)

LEGEND

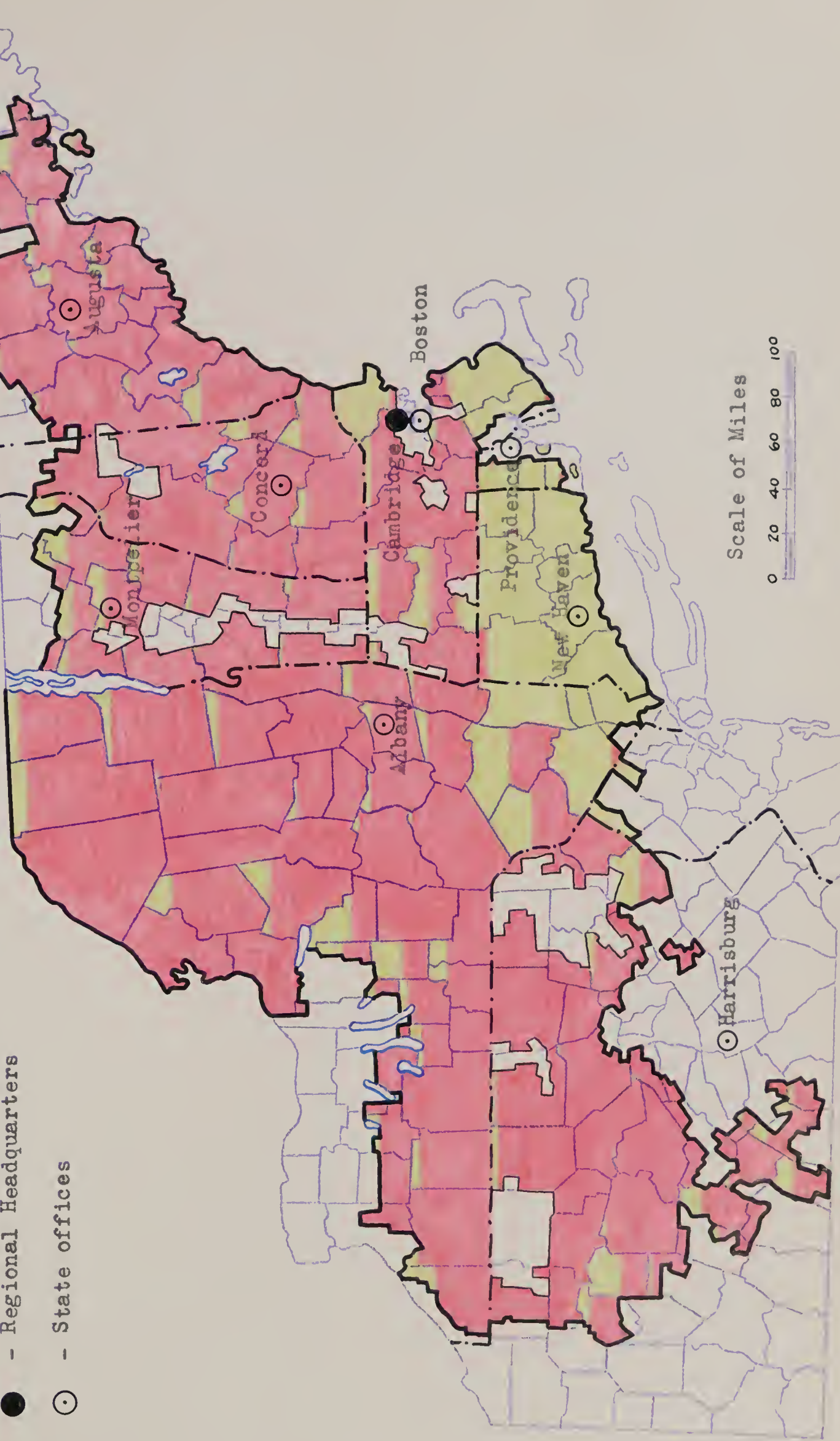
- Control area - 12,709,748 acres
- Mapped - 8,392,834 "
- Unmapped - 4,316,914 "
- Regional Headquarters
- State offices



(Colors show the proportion of each county in the different work classifications, not the actual location of the work.)

LEGEND

- Control area - 12,709,748 acres
- Area on maintenance - 2,433,710 "
- Area not on maintenance - 10,276,038 "
- Regional Headquarters
- State offices



PART II

LEADERSHIP, COORDINATION AND TECHNICAL DIRECTION OF WHITE PINE BLISTER

RUST CONTROL IN NORTHEASTERN REGION - WORK PROJECT BLR-1-1

GENERAL STATEMENT

Under Work Project BLR-1-1, the Bureau of Entomology and Plant Quarantine is responsible for the leadership, coordination and technical direction of all blister rust control activities in the Northeastern Region, which comprises New York, New Jersey, Pennsylvania, and the six New England States. However, no control work has been performed in New Jersey since 1937 as all important white pine areas in that state have been given protection and are now on a maintenance basis.

Other federal agencies participating in the control program in this region are the Forest Service and the National Park Service. These agencies are allotted funds for control work under the Agricultural Appropriation Act, and are responsible for the disbursement of such funds, employment of personnel, and selection of control areas. In this work the Bureau of Entomology and Plant Quarantine is responsible for the preparation of plans, training of field personnel, checking the control work to assure effective results, keeping adequate maps and records, and making reports of the results of control activities. Projects on federal lands in this region during 1943 were restricted to Acadia National Park in Maine and the White Mountain National Forest in New Hampshire and Maine. Detailed information on the results of such activities are given in Parts IV and V of this report.

Cooperative control work on state and privately-owned lands in each of the Northeastern States is conducted under a memorandum of understanding between the Bureau of Entomology and Plant Quarantine and the authorized state regulatory agency - usually the state forestry department. Under each of these agreements, the Bureau furnishes the services of a state blister rust control leader and such district leaders as may be agreed upon from time to time in accordance with the needs of the work and the availability of funds. These leaders give direct supervision to all control activities in their respective districts. The cooperating states furnish the services of a responsible state employee (usually state forester) who has nominal charge of the cooperative program and is responsible for all matters concerned with carrying out any state laws and policies with respect to blister rust control. The states also cooperate with counties, towns, associations and individuals in the local eradication of ribes; furnish the necessary office space and facilities at state headquarters for the direction of the cooperative work; and enforce state laws for the effective prosecution of blister rust control work, including regulation of the intrastate movement of blister rust host plants.

Under the cooperative agreement in New Hampshire, the five district blister rust control leaders also act as district forest fire wardens and spend about one fourth of their total time on such activities, the cost of which is paid from forest fire control funds. A similar arrangement prevails in Vermont, where the three district leaders spend one quarter of their total time on informational and service work in connection with fire protection and other general forestry activities.

The blister rust control responsibilities of the Bureau of Entomology and Plant Quarantine in the Northeastern States are administered by the regional office of the Division of Plant Disease Control located at Cambridge, Mass. This office provides the over-all planning and coordinates into a uniform program the different phases of control work performed in cooperation with state and federal agencies; budgets federal funds for field work; inspects field activities to make sure effective results are accomplished; conducts special field surveys; furnishes the blister rust control leaders and cooperative employees with subject matter and technical information essential to the proper conduct of their work; summarizes and analyzes records of accomplishments; makes purchases of supplies, materials and equipment; processes all payrolls and accounts paid from federal funds; and prepares special records, periodical and annual reports.

The Division of Domestic Plant Quarantine of the Bureau of Entomology and Plant Quarantine is responsible for the enforcement of federal regulations on the interstate movement of blister rust host plants.

Personnel

The permanent personnel of the Division of Plant Disease Control in the Northeastern Region during 1943 consisted of eight regional office employees, six state leaders, and 27 district leaders. In addition, one permanent employee supervises control activities in Rhode Island, the state and Federal Government each paying one half of his salary. In New York, the state blister rust control leader is an employee of the State Conservation Department under federal appointment as a collaborator.

District Leader Kane, of New Hampshire, resigned effective September 14, 1943 and was replaced by Mr. W. S. Codman, who had many years experience on blister rust control work in New York State.

The headquarters of District Leader Strait was changed early in March, 1943 from Hyde Park, N.Y., to Oneonta, N.Y., from which point he supervised control activities in Otsego and Delaware Counties.

The first permanent employee in this region to enter the armed services was District Leader Palmer, of Vermont, who was inducted into the army on January 21, 1943. However, he was given an honorable discharge early in July and resumed work with our Division on July 16, 1943. During his absence, State Leader Conner supervised control activities in the St. Johnsbury district. Most of the

permanent blister rust control personnel in the Northeastern Region are beyond the age limit for duty in the armed services.

Two additional clerk-stenographers were employed under Secretarial appointment at the Cambridge Region Office starting in February, 1943. Such action was necessary to offset in part the loss in clerical personnel due to the termination of the W.P.A. project in Massachusetts.

The following organization chart gives detailed information concerning the permanent federal personnel employed on blister rust control work in the Northeastern Region during 1943.

PERMANENT BLISTER RUST CONTROL PERSONNEL IN NORTHEASTERN STATES - 1943

REGIONAL OFFICE - CAMBRIDGE MASS.
Regional Leader E.C. Filler - P 5
Asst. Regional Leader, K.K. Stimson - P 3

Admin. Ass't, D.B. Cheyne CAF 8
4 Clerk Steno's. CAF 2 to CAF 4

Control } P.L. Rusden - P 2
Specialist }

MAINE
State Leader
W.O. Frost - P 3

NEW YORK
State Leader
W.M. Foss Collab.

NEW HAMPSHIRE
State Leader
L.E. Newman - P 3

MASSACHUSETTS
State Leader
C.C. Perry - P 3

BELFAST
District Leader
H.G. Bradbury SP 8

AUBURN
District Leader
M.G. Calderara SP 8

WARRENSBURG
District Leader
N.H. Harpp - SP 8

SARATOGA SPRINGS
District Leader
P.E. Barber SP 8

KEENE
District Leader
F.J. Baker - SP 8

CONCORD
District Leader
T.J. King - SP 8

SPRINGFIELD
District Leader
R.E. Wheeler - P 2

WAKEFIELD
District Leader
E.M. Brockway - P 2

BRIDGTON
District Leader
D.S. Curtis - SP 8

WATERVILLE
District Leader
J.M. White SP 8

ONEONTA
District Leader
H.G. Strait P 2

GLOVERSVILLE
District Leader
J.W. Charlton P 2

LEBANON
District Leader
G.F. Richardson - P 2

NORTH CONWAY
District Leader
S.W. Boomer - P 2

SHELBURNE FALLS
District Leader
G.S. Doore - SP 8

WORCESTER
District Leader
Wm. Clave - SP 8

BOONVILLE
District Leader
T.R. Woelischlager - P 2

MALONE
District Leader
H.W. Holcomb - SP 8

LITTLETON
District Leader
W.S. Codman SP 8

SCHOHARIE
District Leader
H.J. McCasland P 2

WESTPORT
District Leader
C.B. Kresge - P 2

CONNECTICUT
State Leader
J.E. Riley - P 3

RHODE ISLAND
District Leader
A.C. White - SP 8 CC

VERMONT
State Leader
S.D. Conner - P 3

PENNSYLVANIA
State Leader
R.P. Fatzinger - P 3

CANAAN
District Leader
A.W. Miller - Collab.

Temporary Personnel
Assigned as
Needed

RUTLAND
District Leader
M.R. Mulholland - SP 8

ST. JOHNSBURY
District Leader
E.H. Palmer - SP 8

BELLOWS FALLS
District Leader
F.H. Rose - SP 8

STROUDSBURG
District Leader
P.H. Simmonds - P 2

BROOKVILLE
District Leader
M.J. DeBeerti - P 2

State Leader Newman of New Hampshire also supervises control activities in the Rockingham District.

District Leaders in New Hampshire and Vermont spend one quarter of their time in forest fire protection and other forestry activities.

Cooperation on Farm Forestry and Timber Production War Projects

Because of the urgent need for stimulating production of forest products and the shortage of qualified experienced men for such work, officials of the U. S. Forest Service and the New York Conservation Department requested our Bureau to lend temporarily the services of four of the New York district blister rust control leaders on timber production and farm forestry work. Arrangements were made to detail these four district leaders to the Forest Service effective December 1, 1943. The assignment of one of these leaders was terminated on February 29, 1944. Arrangements have been made to continue the special details of two men until March 31st and one until May 15th. With their intimate knowledge of forest conditions and acquaintance with local people our district leaders were able to assist the programs materially in their districts. Their contacts with timberland owners and lumbermen will be of great value in future blister rust control activities. Arrangements were also made for the other four district blister rust control leaders in New York and the district leaders in Maine, New Hampshire, Vermont and Pennsylvania to cooperate as far as practicable with the U. S. Forest Service on the timber production project in conjunction with their regular blister rust control duties.

Informational and Service Activities of District Leaders

Now that relief funds and labor are no longer available for control work, it is necessary that local cooperators assume a larger proportion of the control costs. Effective informational and service activities are essential to stimulate interest and obtain local cooperation in control work.

During 1943, in spite of travel restrictions due to the shortage of gasoline, there was a notable increase in the amount of informational and service activities in the region as a whole. The effectiveness of this work is seemingly indicated in the record of the substantial amounts of local funds made available in the states where town and county appropriations are the basis for cooperative control work. The cancellation of many agricultural fairs in the region because of war-time restrictions has partially eliminated one of the important methods of disseminating information to the public by means of displays. However, resort has been made to the use of store-window displays, with very satisfactory results. The colored motion picture film was used freely during the year whenever projection equipment was available. There is need for projection equipment in each state, so that advantage may be taken of the war-time films on forestry that are generally available. In Vermont, service work has included the investigation of ribes planting sites in connection with applications for control area permits under the provisions of the federal quarantine. Contacts made in connection with such investigations are indirectly a phase of informational activities as well as service work.

Table 1 summarizes informational and service work performed by the district leaders during 1943 and Table 20 in the Appendix shows accumulative totals for the period 1923 to 1943 inclusive.

Table 1 - Informational and Service Activities of District Leaders During 1943.Informational Activities

State	Meetings Addressed		Radio Talks	Items Published	Displays Placed
	Number	Attendance			
Maine	25	3,449	-	6	3
N.H.	136	13,176	-	85	21
Vt.	50	3,453	-	31	21
Mass.	27	2,645	-	23	12
R.I.	-	-	2	-	2
Conn.	5	623	-	-	-
N.Y.	106	9,569	-	98	5
Penna.	29	3,315	1	3	6
All States	378	36,230	3	251	76

Service Activities

State	Initial Interviews	Follow-up Calls	Persons Instructed in Field
Maine	1130	482	218
N.H.	1137	1357	491
Vt.	780	544	137
Mass.	493	196	55
R.I.	38	25	-
Conn.	128	177	50
N.Y.	1795	1236	1296
Penna.	177	30	263
All States	5678	4047	2510

Control Work By District Leaders

Due to the small number of men employed on control work in many districts during 1943 and the resulting decrease in supervisory requirements, the district leaders were instructed to devote as much of their time as possible to the following activities:

May to September

1. Protection of pine areas by scouting methods to locate and remove ribs from definite blocks in townships suitable for this type of work - particularly in areas which have not been given initial protection.
2. Placing definite units of control area on maintenance as a result of district leader's current field inspection of ribs conditions in blocks protected during previous years.
3. Examination of control areas worked eight or more years ago, and not reinspected, to determine need for re-working based on existing conditions as regards pine, ribs and infection. (The first two projects listed above to be given preference over this one.)

October to April

4. Inspection of blocks in control areas affected by the hurricane of 1938, and/or logging operations prior to that time to determine the amount of existing and potential pine. If the pine stocking is inadequate to meet established minimum requirements, such units should be eliminated from the control area and so indicated on the permanent maps and records.

The district leaders in Maine and a few of the New York leaders were unable to devote much time to these special control activities during the 1943 field season as a relatively high number of laborers were employed in these districts. Consequently, most of their time was spent on supervisory activities. However, several of the leaders in New York and the other states were able to eradicate the ribes from a considerable acreage by scouting methods.

Table 2 summarizes the results of the district leaders' scouting work by states. The 34,822 acres examined by these employees represents 9.4% of the total acreage cleared of ribes in the region during 1943. In Pennsylvania, the blister rust control leaders personally examined 10,492 acres, or 43.5% of the total acreage covered in that state.

Table 2 - Ribes Eradication Work Performed By District Leaders During 1943
(Data included in Table 27 in Appendix)

State	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild	Cult.		Man Days	Ribes
Maine	All Re-Erad.	1,008	63	-	8	.008	0.06
N. H.	Initial	2,791	3,605	-	35	.013	1.3
	Re-Erad.	639	148	-	8	.013	0.2
	Total	3,430	3,753	-	43	.013	1.2
Vt.	Initial	2,305	974	9	12	.005	0.4
	Re-Erad.	925	1,659	-	18	.019	1.8
	Total	3,230	2,633	9	30	.009	0.8
Mass.	Initial	512	129	-	5	.010	0.3
	Re-Erad.	8,032	3,022	-	57	.007	0.4
	Total	8,544	3,151	-	62	.007	0.4
R. I.	All Re-Erad.	2,668	83	-	10	.004	0.03
N. Y.	Initial	3,920	2,567	30	31	.008	0.7
	Re-Erad.	1,530	819	-	15	.010	0.5
	Total	5,450	3,386	30	46	.008	0.6
Penna.	Initial	861	64	10	5	.006	0.09
	Re-Erad.	9,631	358	-	23	.002	0.04
	Total	10,492	422	10	28	.003	0.04
All States	Initial	10,389	7,339	49	88	.008	0.7
	Re-Erad.	24,433	6,152	-	139	.006	0.3
	Total	34,822	13,491	49	227	.007	0.4

Results of Other Special Field Work By District Leaders

In addition to the ribes scouting work, the district leaders personally examined a total of 112,319 acres of control area, of which 58,313 acres were found to be in need of rework, 9,273 acres were placed on maintenance, and 44,733 acres were discontinued from the control area because the present pine stocking did not meet minimum stocking requirements or as a result of a reduction in the width of the protection zones.

The district leaders in six states also spent 238 man days during 1943 on detail mapping of control areas. A few state employees assisted the district leaders for 54 man days on such mapping work in Massachusetts, Rhode Island and Connecticut. As a result of their combined efforts, a total of 35,075 acres was mapped in detail. This acreage represents 75% of all the mapping work performed in the region during 1943 which is summarized, by states, in Table 23 of the Appendix.

Table 3 - Expenditures and Contributed Services for Work Project BLR-1-1
During Calendar Year 1943

State	State Expenditures and Contributed Services			B.E. and P.Q. Expenditures (3101.14)	Grand Total
	Cash Expenditures From State Appropriation	Value of Contributed Services	Total		
Maine	\$786.55	\$685.00	\$1,471.55	\$18,427.86	\$19,899.41
N.H.	502.71	390.00	892.71	18,443.97	19,336.68
Vt.	-	1,232.44	1,232.44	11,824.76	13,057.20
Mass.	-	720.00	720.00	18,038.53	18,758.53
R.I.	-	948.34	948.34	216.66	1,165.00
Conn.	120.00	1,399.98	1,519.98	4,889.93	6,409.91
N.Y.	-	6,399.96	6,399.96	22,838.69	29,238.65
Penna.	-	757.38	757.38	11,848.58	12,605.96
All States	\$1,409.26	\$12,533.10	\$13,942.36	\$106,528.98	\$120,471.34

Table 4 - Classification of Federal 3101.14 Expenditures For Work Project BLR-1-1
During Calendar Year 1943

State	Salaries of Appointees	L/A Expenditures	Leases	Purchase Orders	Total
Maine	\$15,991.56	\$2,172.30	\$264.00	-	\$18,427.86
N.H.	17,397.70	626.27	420.00	-	18,443.97
Vt.	10,285.73	1,526.53	12.50	-	11,824.76
Mass.	16,981.08	937.45	120.00	-	18,038.53
R.I.	216.66	-	-	-	216.66
Conn.	4,320.80	569.13	-	-	4,889.93
N.Y.	19,567.36	2,894.35	370.50	\$6.48	22,838.69
Penna.	10,755.48	949.10	144.00	-	11,848.58
All States	\$95,516.37	\$9,675.13	\$1,331.00	\$6.48	\$106,528.98

PART III

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATELY-OWNED
LANDS IN NORTHEASTERN REGION - WORK PROJECT BLR-3-1

GENERAL STATEMENT

In the Northeastern Region, over 99% of the white pine forests are in state or private ownership, chiefly farm wood lots. The blister rust control problem on such lands involves a present net control area of 12,678,954 acres, of which 4,255,838 acres are in white pine growth meeting minimum stocking requirements. As a result of the ribes eradication work performed during the period 1918-1943, inclusive, initial protection has been established on 85.2% of the present net control area. Approximately one-third of the control area has been reworked once, while 3.5% has been reworked twice. Several hundred thousand additional acres have been worked but later discontinued from the control area due to various causes, such as fire, logging, hurricane damage, etc.

Cooperative agreements between the Bureau of Entomology and Plant Quarantine and the several states constitute the basis for control work on state and privately-owned lands in the Northeastern Region. Under the provisions of the Lee Act, federal funds are made available through department appropriations for blister rust control activities on state and private lands. Such money must be matched by at least an equal amount appropriated, subscribed or contributed by the states and local co-operators. Federal funds (3103.14) were allotted for such cooperative control work to all states in this region, except New Jersey, during 1943. During January, limited funds were expended from balances in State W.P.A. control projects in New York and Pennsylvania.

State and Local Cooperation During 1943

Increases in state appropriations for 1943 totaled \$6200. However, the percentage of increase of such funds over 1942 by states amounted to 100% in Pennsylvania, 67% in Massachusetts, 50% in New Hampshire and 3% in Maine. In New York there was a decrease of \$3070. or 13.7%.

State and local cooperative expenditures and contributed services for control work on state and privately-owned lands during the calendar year 1943 amounted to \$76,175.61. Of this total, \$43,372.14 was from state blister rust control appropriations or other state funds. Cash expenditures by local cooperators were as follows: individuals - \$906.56; towns - \$17,400.82; and counties - \$7,552.83. The value of contributed services by all state and local agencies was \$6,943.21.

Federal 3103.14 expenditures during the current calendar year amounted to \$102,336.89 which is \$26,161.28 more than the total state and local cooperative expenditures. However, the federal expenditures include \$17,993.23 for overtime pay

which does not have to be matched by the state and local cooperators on a dollar for dollar basis. Such cooperative expenditures and contributed services for Project BLR-3-1 for the fiscal years 1942, 1943 and 1944 will exceed federal \$103.14 expenditures in all states, except possibly in Vermont where there may be a slight deficit.

Town cooperation was solicited during 1943 in Maine, New Hampshire, Vermont, Connecticut and in one New York district. As indicated in Table 21 on Page 47 of the Appendix, 106 towns in these five states appropriated a total of \$25,278.00 for control work during 1943. In addition, five cities and towns in Massachusetts contributed to the program through the expenditure of funds amounting to \$780.72 for the protection of white pine on their water supply reservations. In Maine, a new "high" record was established involving appropriations totalling \$10,005.00 by 53 towns, or an increase over 1942 of 134 percent in money and 89 percent in number of cooperating towns. Under the Connecticut plan whereby towns are authorized by law to establish sinking funds for pest control work, 14 towns added \$2,648.00 to the accumulated funds. At the end of 1943, there was an unexpended balance of \$5373.15 in the sinking funds which have been established by 16 Connecticut towns. During 1943, only \$424.60 was expended from these funds. In Vermont, town appropriations were solicited for the first time in 1943. Twelve towns subscribed \$2550. In New York, ten towns in Essex and Warren counties appropriated \$5550. during 1943, an increase over 1942 of 100% in number of towns and 95% in amount of money. Town funds in New Hampshire decreased 16 percent during 1943 compared with the previous year. In Maine and New Hampshire it was not possible to spend the money which some of the towns appropriated during 1943 due to labor shortages and the reluctance of some town officials to employ non-residents on control work. The unexpended balances amounted to \$4093.24.

County cooperation on control work during 1943 was restricted to New York where 6 counties appropriated a total of \$7950, a very slight reduction from 1942. A total of 47 individual cooperators in the region expended \$906.56 during 1943, compared with an expenditure of \$1870.11 by 51 owners in 1942.

Control Area Mapping - 1943

Due to the limitation of personnel, mapping activities were restricted to the work of a few temporary employees and that by the district leaders. The work was conducted in all states except Maine. Mapping in Pennsylvania was confined to the State W.P.A. project which terminated at the end of January. During the year a total of 49,474 acres was mapped in detail and an additional 102,823 acres were examined but not mapped because the pine did not meet minimum stocking requirements. In connection with the designation of the boundaries of the control areas, 19 miles of lines were painted in the field. The mapping work involved 753 man days labor.

Tables 23 and 24 in the Appendix summarize the work performed during 1943 and the accomplishments for the period 1933-1943, inclusive.

Ribes Eradication Work - 1943

Acute labor shortages again handicapped operations during the ribes eradication season. Resort was made to the use of any type of available labor with resulting differences in effectiveness. Every effort was made to avoid conflict with agricultural and industrial needs. High school students were employed in some instances and where satisfactory leadership was available, results were very satisfactory. At the other age class extreme, men who because of advanced age were unsuited for industrial tasks were hired. Such men very often manifest an exceptionally keen interest in blister rust control work and accomplished excellent results. Their work is usually slow but generally thorough. In addition to the shortage of labor, war-time restrictions in the use of automotive equipment made it difficult to coordinate labor sources with field operations. In Vermont, an attempt was made to solve this difficulty by securing boarding places, the men living in trailers and camping out. Further difficulties were encountered in connection with pay rates and our inability to offer full-time wages. Even in the more remote sections of the region, work at high rates of pay was so readily available, blister rust control employment had little or no appeal.

The following table indicates the maximum number of men employed at any time during the field season.

Table 5 - Temporary Personnel Employed on Ribes Eradication Work During 1943
(Work on State and Private Lands Only)

State	Maximum Number of Laborers, Scouts and Foremen Employed	
	Workers Paid From Federal 3103.14 Funds	All Employees
Maine	67	132
N. H.	42	61
Vt.	20	34
Mass.	21	32
R. I.	2	4
Conn.	16	20
N. Y.	149	203
Penna.	19	19
All States	336	505

Data for federal 3103.14 employees compiled from copies of payrolls at Cambridge Office, while information for all workers obtained from district leaders' semi-monthly personnel reports.

Results of Ribes Eradication Work - 1943

Ribes eradication work was performed on 364,036 acres of state and privately-owned lands during 1943. A total of 2,250,164 wild ribes and 2,867 cultivated bushes were destroyed as a result of 26,839 man days of labor. As indicated in Table 6, 74.5 percent of the total regional acreage represented re-eradication work. In Connecticut and Rhode Island, it was 100 percent, and about 90 percent in Massachusetts. On a regional basis, the number of ribes per acre per district on initial work ranged from a minimum of one in Massachusetts and New Hampshire to a maximum of 67 in the latter state. On re-eradication work, the range was from .05 of a bush in one Pennsylvania district to 74.7 ribes in another district in this same state. Ribes per acre on initial work throughout the region averaged 12.4 bushes compared with 5.2 ribes per acre on reworkings.

On the basis of per acre ribes figures, it would appear that not much control work was needed. However, the ribes do not occur evenly distributed. A large portion of the control areas worked contained few or no ribes and could be examined rapidly by scouting methods and placed on a maintenance basis. In other sections, ribes occurred generally distributed or in concentrations necessitating crew work in order to give adequate protection to the pines.

The acreage worked per district in the region averaged 12,135 acres during 1943, and ranged from 3,179 acres in New Hampshire to 21,163 acres in Maine. A comparison between districts and states is misleading as several factors influenced the volume of control work; namely, amount of local cooperation, availability and quality of labor, abundance and distribution of ribes, and use of scout or crew methods. The allotment of federal funds for ribes eradication work was also based on the amount of state and local money available for this project.

Checking of Ribes Eradication Work

In the Northeastern Region two procedures are used in checking ribes eradication work. The crews frequently check their own work by re-examining portions of strips and keeping a record of results. These data are made available to the district and state leaders, but not to the regional office. The primary purpose of these checks is to keep the crews "on their toes" by giving them first hand information as to the results accomplished. Supervisory checking of ribes eradication is performed by the blister rust control leaders. During 1943 a few state foremen assisted on such activities. These supervisory inspections of ribes eradication work in this region include observations of crews at work and measured general checks of worked areas. Crew inspections enable the district leaders to take immediate action in correcting faulty procedures and keep these men in close touch with any special problems that may arise. The measured general checks consist of sample strips, a half rod or rod in width, run through the most

likely ribes sites in worked areas. Distances are paced and a record kept as regards acreage examined, number of ribes found on check and the footage of their live stem. In this region, a maximum of 20 feet of ribes stem left per acre has been adopted as the standard for approving ribes eradication work. If the checks show more than 20 feet of live stem per acre, the control work is not approved and remedial action is taken. Usually the disapproved control work involves only a relatively small portion of the area. A scout or crew is sent into such sections to remove the missed bushes and to bring the entire job up to standard.

Special forms are provided for recording the data on both types of supervisory inspections. Copies of these reports are sent to the regional office where the data are compiled and bi-weekly summary statements prepared for the state and district leaders.

As indicated in Table 7, a total of 1,453 supervisory inspections, involving 3,847 man hours were made of crews at work. In addition the leaders spent a large amount of time working with inexperienced men training them in proper field procedures. Due to changes in personnel, such training work was required more or less throughout the season.

Measured general checks totaled 1,377 in number and comprised 2,244 acres which represents 0.62 percent of the total acreage cleared of ribes on state and private lands in the region during 1943. This percentage appears low, but there were several factors which reduced the amount the amount of this kind of checking. Three quarters of the total acreage cleared of ribes during 1943 represented reworkings. A large portion of this rework, as well as the initial, was performed by scouting methods due to scarcity of ribes. Such sections require only a limited amount of checking. It was also considered advisable for the district leaders to devote an adequate amount of time to securing labor, training new personnel and organizing the work rather than to emphasize making measured general checks in worked areas. Many of the district leaders also spent considerable time on special control activities such as scouting for ribes, discontinuing portions of control areas where the amount of pine no longer met minimum stocking requirements, and reduction of protection zones in areas yet to be worked.

The control work was approved on over 94 percent of the areas in which measured general checks were made during 1943. In Pennsylvania, 23 percent of the areas checked were disapproved. Most of the unsatisfactory work in this state was in one district and involved areas containing many ribes and difficult working conditions. Eight out of the 11 areas which were disapproved in Connecticut were located in one township where many ribes were encountered in ledgy sites. The state leader reports that the crew employed in this township was composed of inexperienced men and their efficiency was below the usual standard. The relatively low percentage of "approved" checks in Rhode Island was due to the fact that such checks were confined entirely to the sites where the scouts encountered ribes. In the other Northeastern States from 91.8 to 97.8 percent of the areas checked were approved.

Table 6 - Ribes Eradication Work on State and Privately-Owned Lands During 1943

State	Type of Work	Total Acreage Worked	% of Total For Each State	Average Acreage Worked in Each State	No. Ribes Destroyed		Total Man Days	Per Acre		Range of Average Number of Ribes Per Acre Per District In Each State	
					Wild	Cult.		Man Days	Ribes	Min.	Max.
Maine	Initial	16,694	19.7	4,174	227,785	369	1,486	.09	13.7	6.4	28.2
	Re-Erad.	67,957	80.3	16,989	461,914	144	4,082	.06	6.8	5.4	9.1
	Total	84,651	100.0	21,163	689,699	513	5,568	.07	8.2	6.9	10.5
N. H.	Initial	5,427	28.5	905	165,270	-	729	.13	30.5	1.0	67.1
	Re-Erad.	13,645	71.5	2,274	180,387	-	2,179	.16	13.2	1.0	16.9
	Total	19,072	100.0	3,179	345,657	-	2,908	.15	18.1	1.0	26.3
Vt.	Initial	8,939	62.5	2,980	86,014	42	751	.08	9.6	9.3	10.2
	Re-Erad.	5,352	37.5	1,784	32,482	33	536	.10	6.1	4.4	12.3
	Total	14,291	100.0	4,764	118,496	75	1,287	.09	8.3	6.4	10.5
Mass.	Initial	4,711	10.3	1,178	12,438	52	279	.06	2.7	1.0	4.3
	Re-Erad.	40,992	89.7	10,248	75,110	594	1,920	.05	1.8	0.4	2.4
	Total	45,703	100.0	11,426	87,548	646	2,199	.05	1.9	1.1	2.3
R. I.	All										
	Re-Erad.	6,171	100.0	6,171	2,326	-	497	.08	0.4	0.4	0.4
Conn.	"										
		17,547	100.0	17,547	89,401	-	1,309	.07	5.1	5.1	5.1
	Initial	43,190	28.3	5,329	579,647	817	4,709	.11	13.4	2.3	32.6
N. Y.	Re-Erad.	109,294	71.7	13,661	463,394	309	6,918	.06	4.2	1.6	7.7
	Total	152,484	100.0	19,060	1,043,041	1,126	11,627	.08	6.8	1.8	14.7
Penna.	Initial	13,967	57.9	4,656	76,862	507	954	.07	5.5	2.1	27.1
	Re-Erad.	10,150	42.1	3,383	97,134	-	490	.05	9.6	0.05	74.7
	Total	24,117	100.0	8,039	173,996	507	1,444	.06	7.2	2.0	46.2
All States	Initial	92,928	25.5	3,098	1,148,016	1,787	8,908	.095	12.4	-	-
	Re-Erad.	271,108	74.5	9,037	1,402,148	1,080	17,931	.07	5.2	-	-
	Total	364,036	100.0	12,135	2,550,164	2,867	26,839	.07	7.0	-	-

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Table 7 - Supervisory Inspections of Ribes Eradication Work During 1943

State	Supervisory Inspections of Crews at Work		Measured General Checks in Worked Areas						
	Number of Inspections	Hours of Inspection	No. Checks	Hours Check- ing	Acres in Strip Checks	Ribes Live Stem Found on Checks		Control Work	
						Total FLS	FLS Per Acre	Approved	Disapproved
Maine	185	463	61	107	124.50	1,079	8.7	56	5
N. H.	101	201	100	170	90.40	955	10.6	92	8
Vt.	89	195	94	117	107.98	1,131	10.5	87	7
Mass.	185	397	193	314 $\frac{1}{2}$	294.27	2,176	7.4	186	7
R. I.	29	93	18	70	16.70	251	15.4	16	2
Conn.	31	72	66	223 $\frac{3}{4}$	120.04	1,430	11.9	55	11
N. Y.	771	2246	741	1443 $\frac{3}{4}$	1390.54	8,532	6.1	725	16
Penna.	62	180	104	150 $\frac{1}{2}$	99.62	1,184	11.9	80	24
All States	1453	3847	1377	2596 $\frac{1}{2}$	2244.05	17,038	7.6	1297	80

Analysis

State	No. Districts	Averages Per District				% Total Acreage Worked During 1943 Covered By Measured General Checks	% of Worked Areas Checked Which Were Approved
		Acreage Cleared of Ribes (Initial & Re-Erad.)	No. Supervisory Checks*	Hours on Supervisory Checks*	Acreage of Measured General Checks		
Maine	4	21,163	61.5	142.5	31.1	0.15	91.8
N. H.	6	3,179	33.5	61.8	15.1	0.47	92.0
Vt.	3	4,764	61.0	104.0	36.0	0.76	92.6
Mass.	4	4,426	94.5	177.9	73.6	0.61	96.3
R. I.	1	6,171	47.0	163.0	16.7	0.27	88.9
Conn.	1	17,547	97.0	295.7	120.0	0.68	83.3
N. Y.	8	19,060	189.0	461.2	173.8	0.91	97.8
Penna.	3	8,039	55.3	110.2	33.2	0.41	76.9
All States	30	12,135	94.3	214.8	74.8	0.62	94.2

*Includes observations on crew work and measured general checks in worked areas.

Chemical Eradication (Salt and Borax)

Late in the field season, a supply of salt and borax was made available for use in connection with the eradication of large ribes, especially those growing in rocky and ledgy locations. The mixture was used in a limited way in practically every district in the region. Applications were made so late in the season no definite information is available as to its effectiveness. The locations will be checked early in 1944 and the results noted. A change in technique was suggested by one district leader who found it preferable to use a large-sized pruner to decapitate a bush instead of cutting the canes with an eradication tool.

State Compensation For Cultivated Ribes Destroyed During 1943

A total of 2,874 cultivated bushes were removed in connection with control activities in the Northeastern Region during 1943. No compensation was paid for these bushes, except in Pennsylvania where five owners were reimbursed \$3.20 by the state for 56 bushes.

Nursery Sanitation - 1943

Ribes eradication work was performed in the environs of 13 nurseries in Connecticut, New York and Pennsylvania. A total of 614 wild and six cultivated ribes were destroyed on the 6,892 acres examined as a result of 80 man days of labor. All of this work was re-eradication, except 100 acres which involved an extension to the sanitation zone of one Connecticut nursery. The records indicate a total of 35,826,800 white pines growing in the 13 nurseries protected during 1943.

In the Appendix, Tables 33 to 37 summarize the results of the 1943 sanitation work by states, accomplishments during the period 1930-1943, inclusive, by states and programs, and the present status of such activities.

Blister Rust Canker Elimination Work - 1943

Blister Rust canker elimination work during 1943 was restricted to small projects on state and municipally owned lands in Vermont and New York. In the former state, the town of Springfield employed a few laborers to remove blister rust cankers from white pine plantations made about thirty years ago. A few W.P.A. laborers and state employees were assigned to similar work in state-owned plantations for short periods in two New York Districts. This work in New York and Vermont involved the examination of 9,028 white pines, 407 of which were fatally infected and were cut down. A total of 183 branch cankers were also removed from 130 other diseased pines. Only 69 man days labor were devoted to this work.

Tables 38 to 40 in the Appendix summarize data for this activity during 1943 and for the period 1932 - 1943, inclusive, by states, programs and land ownership classes.

Future Control Work on State and Privately-Owned Lands

Detailed plans have been prepared for a proposed program for blister rust control work in the Northeastern Region during a five year period immediately following the war. This plan is based on the assumption that control activities will be continued at approximately the present volume for the duration. The excellent cooperation of the states and local agencies since the outbreak of the war indicates that this should be possible. However, if the labor situation becomes more acute, control activities may have to be curtailed somewhat in certain localities.

At the end of 1943 detail mapping was still needed on 4,289,497 acres or 33.6% of all state and privately-owned lands in the net control area. It is proposed to complete all mapping work during the first three years of the post war program. In addition, it will be necessary to re-examine all previously mapped merchantable pine areas to determine changes in pine stocking due to the hurricane, logging and fire in order that necessary changes can be made in the original maps.

The proposed ribes eradication activities under the five year plan would complete the remaining initial work and the first reworking, and place most of the control area on a maintenance basis. At the end of 1943, there were still 1,882,305 acres not yet worked initially and 5,329,322 acres in need of re-examination at that time. The latter acreage includes areas initially protected five or more years ago which should be re-examined to determine the need for re-work. At least an additional million acres will fall into this category before the completion of the five year plan.

Table 8 below lists detailed information by states on the control work needed on state and privately-owned lands in the Northeastern Region at the end of 1943.

Table 8 - Control Work Needed on State and Privately-Owned Lands As Of December 31, 1943

State	Total Acreage of Net Control Area	Acreage in Net Control Area In Need of			Percentage Net Control Area In Need of		
		Detail Mapping	Initial Erad.	Re-examination	Detail Mapping	Initial Erad.	Re-examination
Maine	2,481,318	391,371	362,210	1,224,307	15.8	14.6	49.3
N. H.	3,151,081	1,724,900	284,366	1,933,049	54.7	9.0	61.3
Vt.	793,310	28,233	350,233	179,190	3.6	44.1	22.6
Mass.	1,833,267	944,881	34,739	716,907	51.5	1.9	39.1
R. I.	181,595	61,269	1,176	0	33.7	0.6	0
Conn.	494,961	0	790	9,786	0	0.2	2.0
N. Y.	2,917,333	964,467	599,805*	1,006,028	33.1	20.6	34.5
N. J.	16,742	16,742	0	0	100.0	0	0
Penn.	809,347	157,634	248,986	260,055	19.5	30.8	32.1
All States	12,678,954	4,289,497	1,882,305	5,329,322	33.8	14.8	42.0

*Includes 228,819 acres in scattered wood lots and plantations in western part of state outside present districts.

Table 9 - Total Expenditures and Contributed Services for Work Project BLR-3-1
During Calendar Year 1945

State	State and Local Cooperative Expenditures and Contributed Services				Federal Funds			Grand Total
	Cash Expenditures			Value of Contributed Services	Total	B.E. & P.Q. (3103.14)	W.P.A. (State)	Total
	State Funds	Towns	Counties					
Maine	\$ 7,477.22	\$ 3,361.90	-	\$ 231.30	\$ 16,070.42	\$ 14,650.01	-	\$ 14,650.01
N. H.	3,866.03	2,074.86	-	893.25	7,232.54	14,359.24	-	14,359.24
Vt.	349.75	2,255.25	-	198.17	2,879.27	4,226.31	-	4,226.31
Mass.	3,592.38	780.72	-	349.50	4,955.76	8,551.44	-	8,551.44
R. I.	2,603.17	-	-	791.20	3,394.37	2,549.06	-	2,549.06
Conn.	5,514.98	424.60	-	-	5,812.53	6,028.06	-	6,028.06
N. Y.	16,798.59	3,503.49	\$7,552.88	4,010.00	31,990.91	48,252.84	360.04	48,612.88
Penna.	3,370.02	-	-	469.79	3,839.81	3,739.42	300.27	4,039.70
All States	\$43,372.14	\$17,400.82	\$7,552.88	\$6,943.21	\$76,175.61	\$102,336.89	\$660.31	\$102,997.20
								\$179,172.81

Table 10 - Classification of B.E. and P.Q. 3103.14 Expenditures for Project BLR-3-1
During Calendar Year 1945

State	Salaries of Appointees	Wages of Laborers	Non-Labor Expenses	Total
Maine	\$ 1,703.28	\$12,205.89	\$ 720.84	\$ 14,650.01
N. H.	3,187.93	10,684.42	486.89	14,359.24
Vt.	467.76	3,665.92	93.13	4,226.81
Mass.	851.64	7,271.81	427.99	8,551.44
R. I.	1,083.30	1,406.40	59.56	2,549.06
Conn.	895.24	4,919.64	213.18	6,028.06
N. Y.	5,880.36	42,101.37	271.11	48,252.84
Penna.	-	3,600.80	138.63	3,739.43
All States	\$14,069.51	\$85,856.25	\$2,411.13	\$102,336.89

Table 11 - Status of B.E. and P.Q. 3103.14 Funds for Fiscal Year 1944

State	Salaries of Appointees				Net Allotment for Fiscal Year	L/A				Balance of Allotment on Jan. 1, 1944
	Original Allotment for Fiscal Year	Expenditures from July 1 to Dec. 31, 1943				Expenditures from July 1 to Dec. 31, 1944				
		Base Pay	Over-time	Total		Wages of Laborers		Non-Labor Expenses	Total	
						Base Pay	Overtime			
Maine	-	-	-	-	\$14,050.00	\$ 6,617.95	\$1,431.81	\$403.02	\$ 8,452.78	\$ 5,597.22
N. H.	\$2,680.00	\$1,339.92	\$303.36	\$1,643.28	\$1,036.72*	6,711.85	1,542.56	356.79	8,611.20	538.80
Vt.	-	-	-	-	3,630.00	1,737.80	378.77	60.49	2,177.06	1,452.94
Mass.	-	-	-	-	6,850.00	3,407.89	720.49	267.87	4,396.25	2,453.75
R. I.	1,300.00	649.98	-	649.98	1,500.00	737.40	147.18	36.83	921.41	578.59
Conn.	-	-	-	-	4,650.00	2,673.20	608.38	22.72	3,304.30	1,345.70
N. Y.	2,800.00	1,166.60	252.80	1,419.40	27,400.00	18,537.85	4,145.04	120.76	22,803.65	4,596.35
Penna.	-	-	-	-	1,930.00	1,043.20	242.37	81.48	1,367.05	562.95
All States	\$6,780.00	\$3,156.50	\$556.16	\$3,712.66	\$68,960.00	\$41,467.14	\$9,216.60	\$1,349.96	\$52,035.70	\$16,926.30

*Includes supplemental allotment of \$1,500 on December 10, 1943.

The expenditures for salaries of appointees in New York do not include base pay and overtime for District Leader Barber during December, 1943 when he was assigned to T.P.W.P. activities.

In addition to the L/A allotments listed in Table 11, there is also an unallotted balance of \$660 available as of January 1, 1944.

It is anticipated that funds from deficiency appropriations will be made available to cover the cost of all overtime pay for appointees, overtime pay of laborers employed during the period July 1 to December 31, 1943 amounting to \$9,216.60 and any overtime pay of laborers paid out of the balances of L/A allotments as of January 1, 1944.

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PART IV

BLISTER RUST CONTROL WORK ON NATIONAL FORESTS - FINANCIAL PROJECT BLR-4

GENERAL STATEMENT

The Bureau of Entomology and Plant Quarantine is cooperating with the U. S. Forest Service in the control of blister rust on national forest lands in the North-eastern Region involving projects on the White Mountain National Forest in New Hampshire and Maine and the Allegheny National Forest in Pennsylvania. Initial control work has been completed on all White Mountain National Forest areas, except one small tract in Maine, and the majority of the control areas have been reworked once. There are several hundred acres of pine, chiefly recent acquisitions, on the Allegheny National Forest still in need of initial protection.

Control activities during 1943 were restricted to the White Mountain National Forest where two experienced men were employed to complete any necessary detail mapping and determine ribes conditions in the control areas. In addition, the ribes were removed in any tracts where it was possible to do so by scouting methods, and the bounds of areas requiring crew work were designated on maps. District Blister Rust Control Leader Boomer, who is headquartered at North Conway, N.H., gave technical supervision to the 1943 control activities on the White Mountain National Forest.

Results of 1943 Control Activities (White Mountain National Forest)

Early in April, conferences relating to the 1943 control activities were held with Forest Service officials at Laconia, N.H. In accordance with their management plans for the White Mountain National Forest, it was agreed that certain tracts, which had been examined for ribes in previous years, would be discontinued from the control area because the value of the pine did not justify the cost of further protection measures which would be relatively high due to several factors. A considerable portion of this discontinued acreage was in the upper Swift River Valley where ribes were very plentiful and the pines became badly diseased before initial control measures were applied. One additional area was discontinued as a result of the 1943 survey work due to the small amount of white pine and its inaccessibility. The present net control area on the White Mountain National Forest comprises 3,446 acres of which 1,087 acres are in white pine growth.

Control areas aggregating 2,817 acres were mapped in detail during 1943 which completed this phase of the control project on the White Mountain National Forest. Ribes eradication work was also performed by scouting methods on 2,709 acres and an additional 737 acres were found to be in need of ribes eradication. All areas in the New Hampshire portion of the forest were surveyed during May and June, but it was necessary to postpone similar work on the Maine tracts until October due to a delay in the allotment of funds for the fiscal year 1944 and labor problems. The two scouts assigned to the project were employed for 105½ man days during 1943.

Table 12 - Control Accomplishments During 1943
(White Mountain National Forest)

Control Areas In	Acreage Mapped in Detail	Acreage Cleared of Ribes By Scouting Methods	No. Ribes Destroyed	Additional Acreage in Need of Erad. Work	Total Man Days	Total Cost (All Paid By Forest Service)
New Hampshire	2,319	2,709	727	239	72½	\$448.50
Maine	498	0	0	498	33	176.82
Total	2,817	2,709	727	737	105½	625.32

Due to the fact that the ribes scouting work was combined with the mapping, it was not possible to segregate the man hours data for each type of work.

Funds For Control Work During Fiscal Years 1943 and 1944

The Forest Service allotted \$960. for control work on the White Mountain National Forest during May and June, 1943. Of this total, \$448.50 was used for work on areas in New Hampshire. Expenditures included \$441.18 for wages and \$7.32 for supplies and materials.

An allotment of \$1,000.00 was made for similar work during the fiscal year 1944. A total of \$176.82 was spent for wages of two men employed on the survey project in Maine during October, leaving a balance of \$823.18 in the allotment for the current fiscal year.

Proposed Control Work During Calendar Year 1944

Based on the results of the 1943 survey work, there are seven areas totalling 737 acres which are still in need of ribes eradication on the White Mountain National Forest. It is estimated that this work will require approximately 64 man days labor. The work on two of the areas in Maine, comprising 498 acres, can be performed by scouts. Crew work will be required on all five areas in New Hampshire totalling 239 acres. It is recommended that this control work be performed as early in the spring of 1944 as practicable.

The Allegheny National Forest officials submitted estimates for blister rust control activities involving expenditures of \$6,512.50 and \$9,509.00, respectively, during the fiscal years 1943 and 1944. Due to the acute labor shortage in that vicinity, no control work was performed during the calendar year 1943. The labor situation has not improved and no control work is contemplated for the remainder of the fiscal year 1944. The forest supervisor plans to submit estimates for the fiscal year 1945 which will be substantially the same as those set up for 1944.

Table 13 - Ribes Eradication Work on National Forests, 1924-1943, Inclusive

National Forest	Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
				Wild	Cult.		Man Days	Ribes
White Mountain	Regular	Initial	6,779	182,493	-	554	.08	26.9
		Re-Erad.	7,888	15,284	-	289	.04	1.9
		Total	14,667	197,777	-	843	.06	13.5
	C.C.C.	Initial	1,950	633,781	85	2,325	1.19	325.0
		Re-Erad.	3,799	309,521	-	1,700	.45	81.5
		Total	5,749	943,302	85	4,025	.70	164.1
	All	Initial	8,729	816,274	85	2,879	.33	93.5
		Re-Erad.	11,687	324,805	-	1,989	.17	27.8
		Total	20,416	1,141,079	85	4,869	.24	55.9
Allegheny	Regular	Initial	891	129,019	8	194	.22	144.8
		Re-Erad.	881	21,691	-	152	.17	24.6
		Total	1,772	150,710	8	346	.20	85.1
	C.C.C.	Initial	3,490	641,805	22	2,432	.70	183.9
		Re-Erad.	525	41,068	-	435	.83	78.2
		Total	4,015	682,873	22	2,867	.71	170.1
	All	Initial	4,381	770,824	30	2,626	.60	176.0
		Re-Erad.	1,406	62,759	-	587	.42	44.6
		Total	5,787	833,583	30	3,213	.56	144.0
Total	Regular	Initial	7,670	311,512	8	748	.10	40.6
		Re-Erad.	8,769	36,975	-	441	.05	4.2
		Total	16,439	348,487	8	1,189	.07	21.2
	C.C.C.	Initial	5,440	1,275,586	107	4,757	.87	234.5
		Re-Erad.	4,324	350,589	-	2,135	.49	81.1
		Total	9,764	1,626,175	107	6,892	.71	166.6
	All	Initial	13,110	1,587,098	115	5,505	.42	152.9
		Re-Erad.	13,093	387,564	-	2,576	.20	29.6
		Total	26,203	1,974,662	115	8,081	.31	75.4

Table 14 - Status of Ribes Eradication Work on National Forests
December 31, 1943

National Forest	Total Acreage of Net Control Area	Acreage of White Pine in Net Control Area	Acreage Detail Mapped in Net Control Area	Acreage Worked in Net Control Area			% Net Control Area			Acreage in Net Control Area Not Yet Worked Initially
				Initial	1st Re-Work	2nd Re-Work	Initially Worked	Re-Worked		
								Once	Twice	
White Mountain	3,446	1,037	3,446	3,334	3,168	1,486	96.7	91.9	43.1	112
Allegheny	6,167	1,191	4,381	4,381	904	461	71.0	14.7	7.5	1,786
Total	9,613	2,278	7,827	7,715	4,072	1,947	80.3	42.4	20.3	1,898

In addition to the 1,786 acres shown in Table 14 as still in need of initial control work

on the Allegheny National Forest, it is estimated that protection measures will be required on approximately four thousand acres of the large tract acquired from the Wheeler-Dusenbury Lumber Company during the fiscal year 1943.

Table 15 - Expenditures For Blister Rust Control on National Forests
1924 - 1943, Inclusive

Source of Funds	White Mountain National Forest	Allegheny National Forest	Total
Forest Service	\$3,208.68	\$1,009.77	\$4,218.45
Bureau of Plant Industry	75.63	207.85	283.48
State of New Hampshire	357.61	-	357.61
C.C.C.	8,096.47	4,984.02	13,080.49
Total	\$11,738.39	\$6,201.64	\$17,940.03

The costs for the control projects on the White Mountain and Allegheny National Forest do not include any charges for the supervisory activities of employees of the Forest Service, Bureau of Plant Industry and Bureau of Entomology and Plant Quarantine. The C.C.C. costs were computed on the basis of an arbitrary charge of \$1.00 per eight hour man day for the time the enlisted men spent on the project plus 35 cents per day for subsistence in 1933, 40 cents in 1934, and 50 cents during the period 1935-1939, inclusive. C.C.C. expenditures also include the actual cost of technical foremen assigned to the project and estimated costs of transportation for the entire C.C.C. personnel.

PART V

BLISTER RUST CONTROL ON NATIONAL PARKS - FINANCIAL PROJECT BLR-5

GENERAL STATEMENT

The National Park Service and the Bureau of Entomology and Plant Quarantine are cooperating in the application of blister rust control measures at Acadia National Park in Maine where white pine is of special importance from a recreational and scenic viewpoint. Control work has also been conducted on several recreational demonstration areas which are under the jurisdiction of the National Park Service. Necessary ribes eradication work was performed on most of these areas in connection with the regular cooperative control program prior to the time these tracts were acquired by the Federal Government. During 1941, an attempt was made to compile a record of all control work performed on these recreational demonstration areas, but in most instances it was not possible to segregate the ribes, man hours, and cost data. According to present plans, the Hickory Run Recreational Demonstration Area in Carbon County, Pennsylvania, will be continued indefinitely under the jurisdiction of the National Park Service, but all of the other areas where control work has been performed in past years will be transferred to the states concerned. Consequently, the data for control work on National Park Service lands in this region will be restricted to the projects at Acadia Park and the Hickory Run Recreational Demonstration Area.

ACADIA NATIONAL PARK PROJECT

A survey during the fall of 1928 showed that blister rust infection was general throughout the white pine areas on Acadia National Park and prompt application of control measures was necessary. During the period 1929-1932, inclusive, the National Park Service and the Bureau of Plant Industry cooperated by furnishing funds for control work, the latter agency being responsible for necessary technical supervision. Practically all of the control work from 1933-1941, inclusive, was performed by C.C.C. personnel from the two camps on Mount Desert Island. Since 1941, funds contained in the Agricultural Appropriation Acts have been allotted to the National Park Service for control work under the provisions of the Lea Act which was approved on April 26, 1941.

Initial ribes eradication work has been completed on all present and prospective Acadia National Park lands totalling 20,716 acres, which contain sufficient white pine to justify the cost of control measures. During 1943 minor adjustments were made in a few of the units which reduced the total net control area to 20,450 acres. A total of 11,264 acres, or 55.1% of the net control area has been reworked once. As a result of this rework and the systematic post checking of 14,843 acres during the period 1941-1943, inclusive, 14,577 acres, or 71.3% of the net control area is now regarded as being on a maintenance basis. In other words, the ribes on these areas are so scarce that danger from blister rust is negligible for an indefinite period. To assure the continuation of this safe condition will require periodic examinations and in some instances ribes eradication chiefly by scouting methods.

Thousands of valuable scenic white pines along many of the most important roads have been saved as a result of the blister rust canker elimination work which was performed chiefly by C.C.C. crews during the period 1932-1939, inclusive. Such treatment is urgently needed on numerous other areas in the Park.

Control Activities During Calendar Year 1943

Original plans for the 1943 control activities at Acadia National Park provided for the employment of one scout on the post checking work and a six-man ribes eradication crew for approximately $3\frac{1}{2}$ months starting May 15th. A junior from the New York State College of Forestry was employed on the checking project starting May 10th, but he resigned on June 10th to enroll in the Civil Air Patrol. It was not possible to obtain a qualified replacement for this position at that late date; consequently, only a limited amount of post checking work was performed during 1943. Due to the acute labor shortage, it was necessary to use local high school boys on the ribes eradication work, and as these boys were not available until June 4th, two crews were employed instead of one as originally planned. All areas designated for crew work during 1943 were completed by August 28th when the project was terminated for the season. It was possible to obtain a college freshman to give general supervision to the ribes eradication activities and act as foreman of one of the crews, and his services as well as the high school students were very satisfactory.

District Blister Rust Control Leader Bradbury, who is headquartered at Belfast, Me., spent two days training the crews and made several visits to Acadia Park during the season to inspect control activities. Employees of the Cambridge, Mass. regional office of the Division of Plant Disease Control also assisted the Park Service officials by furnishing technical direction to the project.

Post Checking Work During 1943

The purpose of the post checking, which was started in 1941 at Acadia National Park, is to determine the need for reworking areas where no control work has been performed for at least five years. Parallel strip checks, a half rod or a rod in width, are run in cardinal directions at 5 or 10 chain intervals throughout each block unit. In addition, offsets are made in sites where conditions are especially favorable for ribes growth and measured general checks are made along all roadsides. A box compass is used in running the strip lines, and distances measured by pacing. Data are recorded on the number and live stem of all ribes found on the stripes.

During 1943, approximately a 5% check was made of three areas comprising 656 acres which were initially cleared of ribes in 1929 and 1931, and reworked by C.C.C. crews more than five years ago. Only one small ribes bush was found in the three units checked during 1943, and the results indicate that no further control work will be needed on these areas for many years unless there is some unusual disturbance of the forest floor which would cause germination of dormant ribes seeds.

Table 16- Results of Post Checking Work During Period 1941-1943, Inclusive

Previous Treatment	Total Acreage of Blocks Checked	Total Acreage Checked	% Checked	Total Acreage in Need of Rework	% Total Acreage of Blocks in Need of Rework
Worked Once	11,560	551.67	4.77	1,609	13.9
Worked Twice	3,283	257.99	7.86	0	0
Total	14,843	809.66	5.45	1,609	10.8

As indicated in Table 16, systematic strip line checks have been made in control areas at Acadia National Park aggregating 14,843 acres to determine the need for ribes re-eradication work. Initial control work was performed on all of these areas during the period 1928-1936, inclusive, and units totalling 3,283 acres had also been reworked once at least five years prior to the strip line surveys. In the areas where only initial control work had been performed, the data obtained on the strip checks indicated that rework was needed on 1,609 acres, or 13.9%, of the total acreage of these control units. All the necessary ribes eradication work on these tracts was completed during 1943. No rework was found to be necessary as a result of the surveys in areas comprising 3,283 acres which had been previously worked twice.

The post checking work is now completed on all but 5,825 acres of the control areas at Acadia Park where no ribes eradication work has been performed for at least five years. Of this total, 4,600 acres have been worked twice and the remaining 1,225 acres were initially cleared of ribes during 1937 and 1939.

Ribes Eradication Work During 1943

The areas which were cleared of ribes during 1943 were those sections of blocks which were considered as being in need of reworking as a result of the strip line surveys made in 1941 and 1942.

Two standard size six-man crews were used to cover the areas in strip formation, the spacing of the men in line being varied in accordance with the density of undergrowth, topography, abundance of ribes, etc. The crew foremen checked behind the line following a zig-zag course in order to observe as much ground as possible. Paper was used to mark the bounds of the crew strips.

A total of 20,745 currant and gooseberry bushes were removed from the thirteen units, comprising 1,609 acres, which were examined as a result of 506 man days labor by the two crews assigned to the project during the period June 4 August 28, 1943, inclusive. A detailed summary of the accomplishments by block units is given in the special report of the 1943 control activities at Acadia National Park which was submitted on November 27, 1943.

Table 17 - Ribes Eradication Work at Acadia National Park
1929-1943, Inclusive

Program	Type of Work	Total Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild	Cult.		Man Days	Ribes
Regular	Initial	7,726	503,920	-	2,798	.36	65.2
	Re-erad.	1,837	20,778	1	526	.29	11.3
	Total	9,563	524,698	1	3,324	.35	54.9
C.C.C.	Initial	12,990	389,727	293	8,429	.65	30.0
	Re-erad.	9,427	35,191	-	3,564	.38	3.7
	Total	22,417	424,918	293	11,993	.53	19.0
All	Initial	20,716	893,647	293	11,227	.54	43.2
	Re-erad.	11,264	55,969	1	4,090	.36	5.0
	Total	31,980	949,616	294	15,317	.48	29.7

Table 18 - Blister Rust Canker Elimination Work at Acadia National Park
(Work performed during period 1932-1939, inclusive)

Program	Total No. Pines Examined	No. Infected Pines Cut Down	No. Infected Pines From Which Cankers Removed	No. Cankers Removed		Total Man Days
				Branch	Stem	
Regular	2,546	319	715	1,480	61	100
C.C.C.	58,261	2,957	8,879	27,054	2,691	2,177
All	60,807	3,276	9,594	28,534	2,752	2,277

Expenditures For Blister Rust Control Work at Acadia National Park

Calendar Year 1943

	<u>Amount</u>
National Park Service - Fiscal Year 1943 allotment	\$1020.73
National Park Service - Fiscal Year 1944 allotment	<u>1675.38</u>
	\$2696.11

Calendar Years 1929-1943, Inclusive

National Park Service	\$14,176.05
Bureau of Plant Industry	3,145.83
C.C.C.	<u>29,880.36</u>
	\$47,202.24

The costs for the control project at Acadia National Park do not include any charges for the supervisory activities of employees of the Bureau of Plant Industry or Bureau of Entomology and Plant Quarantine. The C.C.C. costs were computed on the basis of an arbitrary charge of \$1.00 per eight-hour day for the time the enlisted men spent on the project plus 35 cents per day for subsistence in 1933, 40 cents in 1934 and 50 cents during the period 1935-1942, inclusive. C.C.C. expenditures also include the actual cost of technical foremen and checkers assigned to the project and estimated cost of transportation for the entire C.C.C. personnel.

Proposed Control Work During Calendar Year 1944

There is a balance of \$924.62 in the fiscal year 1944 allotment available for control work during May and June, 1944 at Acadia National Park. An allotment of \$2600.00 has been recommended for the fiscal year 1945.

At the present time, there are 5,825 acres which should be systematically checked to ascertain if ribes eradication is now necessary on these tracts where no control work has been performed for at least five years. It is estimated that this survey work will require the services of two experienced scouts for approximately two months.

All areas which were found to be in need of ribes eradication work as a result of the 1941-1943 post checking activities were completed by the crews during the 1943 season. It is anticipated that additional areas will be found where ribes eradication work will be needed during 1944 as a result of the proposed post checking. If the two checkers recommended above are employed starting May 16th, their wage costs, computed at the rate of \$135. per month base pay plus overtime, would amount to \$493. for the balance of the fiscal year. This would leave approximately \$432. available for the wages of laborers prior to July 1st which would employ one six-man crew for about a month. Undoubtedly it will be necessary to rely on high school boys for labor during the 1944 season and their services would not be available until early in June. This would give the checkers, who would be assigned effective May 16th, an opportunity to complete the survey work in several areas and line up any necessary crew work in advance.

The estimates which have been submitted for blister rust control work at Acadia National Park during the fiscal year 1945 provide for the employment of two checkers from July 1 to August 31, 1944 and for a six-man ribes eradication crew during the same period and from June 5 to 30, 1945. If the checkers complete the post checking project prior to August 31st, they can assist on the ribes eradication activities. In any case, one of these checkers would be needed to supervise the latter project and could act as foreman of the crew. There is a possibility that few areas will be found where ribes eradication work will be needed. If this situation develops, the laborers could advantageously be assigned to blister rust canker elimination work for the balance of the season after completing any areas needing ribes eradication.

HICKORY RUN RECREATIONAL DEMONSTRATION AREA

During the period 1937-1939, inclusive, the National Park Service conducted ribes eradication work on 4800 acres of the Hickory Run Recreational Demonstration Area located in Carbon County, Pennsylvania. A total of 75,000 wild ribes were destroyed as a result of 1,318 man days labor by employees assigned to this project at a cost of \$5,598.08, all of which was paid from E.R.A. funds.

Blister Rust Control Leaders Fatzinger and Simmonds recently made a survey of the Hickory Run Recreational Demonstration Area. An examination of aerial photographs showed the location of coniferous types on the area and a check-up of these sections on the ground indicated that a large percentage of the areas worked during the period 1937-1939 do not contain sufficient white pine to justify additional control measures. Based on this survey, it is estimated that sections totalling 800 acres containing about 280 acres of white pine should be retained in the control area. This includes the section from the park office to the top of the hill on both sides of the highway towards the fire tower and the section from the office up Hickory Run including the Saylorville area and the Hickory Run Lake area.

As five years have elapsed since any control work has been performed on the Hickory Run Recreational Demonstration Area, it is recommended that the portions totalling 800 acres, which are to be retained in the control area, be re-examined for ribes as soon as practicable.

Table 19 - Status of Ribes Eradication Work on National Park Lands
December 31, 1943

Location	Acreage of Net Control Area	Acreage of White Pine in Net Control Area	Gross Acreage Reported Worked		Net Acreage Worked		Percentage of Net Control Area	
			Initial	1st Rework	Initial	1st Rework	Initially Worked	Reworked Once
Acadia National Park	20,450	3,638	20,716	11,264	20,450	11,264	100.0	55.1
Hickory Run Recreational Demonstration Area	800	280	4,800	-	800	-	100.0	-
Total	21,250	3,918	25,516	11,264	21,250	11,264	100.0	53.0

As a result of the first rework and the post checking performed during the past three years, 14,577 acres, or 71.3% of the net control area at Acadia National Park is now considered to be on a maintenance basis.

PART VI

SURVEYS AND STUDIES OF RIBES AND PINE IN RELATION TO
THE CONTROL OF BLISTER RUST

P. L. Rusden, Agent

During the first months of 1943 all of the 1942 studies were summarized up to date. It was decided, because of the uncertainty as to whether Dr. Rusden would enter military service, to curtail current field surveys as much as possible. All studies being conducted at that time were temporarily set aside when it was determined that that could be done without seriously impairing the continuity of data records. These delayed studies included; observations of pine and ribes growth in the New England areas affected by the hurricane of 1938, The Pack Forest pine and ribes regeneration studies and, elsewhere, the experiments in the treatment of blister rust stem cankers. A full account of the status of this work was given in the 1942 annual report.

For the remainder of the calendar year 1943 studies were carried on in Maine, New Hampshire, Vermont and New York. Full advantage was taken of the fact that several of the district leaders because of reductions of control activities in their districts were able to devote considerable time to field studies. These 1943 surveys and studies are grouped under four main headings. The nature of this work will be indicated here briefly and with no attempt to present tabulations of field data or to go into detail regarding the results. Preliminary, detailed reports of data and results are filed pending further observations.

1. Plot Surveys of Ribes in Relation to Pine Infestation on Unprotected Areas of
New Hampshire, Vermont and New York

During the period June to September, surveys were made in seven towns of four blister rust control districts in three of the Northeastern States. A series of 13 pine and ribes plots was established (N.H.-10, Vt.-1, N.Y.-2) to determine the prevalence of white pine blister rust infection on unprotected pine areas where the following conditions were fulfilled:

- 1) No ribes eradication performed at any time.
- 2) Pines averaged less than 25 feet in height.
- 3) Blister rust infection present, at least before 1930.
- 4) Ribes present within 3 chains of the outer edge of the pine area and in sufficient numbers for recent infection of some of the pines to appear likely.

With these conditions in mind, maps and office records were examined and preliminary field examinations of likely areas were made to select the sites best suited to the study. The majority of sites examined failed to meet one or more of

the conditions imposed. Most of the areas examined were discarded because very few ribes could be found. A considerable amount of pine infection was present in these cases; no ribes had been eradicated but for other reasons (such as shade suppression) too few bushes were present for any appreciable amount of recent blister rust infection to appear likely. So much initial ribes eradication has already been done in the region that large portions of the control area were, of course, immediately ruled out.

Each plot in the study consists of a square, one-acre pine area surrounded by three concentric zones, each one chain in width. Pine data were recorded for the one-acre plot while ribes data were obtained for this plot plus the chain-wide zones about it, an aggregate of 8.38 acres of control area.

One interesting feature of this study was the fact that several areas examined showed rather small amounts of pine infection in spite of the presence of rather large quantities of ribes live stem within three chains of the pine.

Another interesting situation was provided at West Rutland, Vt., where the numbers of blister rust cankers of recent origin appeared to be increasing up to the last year for which identification was practicable.

These and other special features of this study are discussed in detail in the preliminary reports. It is probably desirable to collect a somewhat larger volume of data from similar studies before making a final report.

2. Stripline Survey of Unprotected Pine in New Hampshire.

Partly to overcome the objection of selecting areas of maximum pine infection and ribes used in "Plot Surveys of Ribes in Relation to Pine Infection on Unprotected Areas of New Hampshire, Vermont and New York" a stripline survey was made in two road-blocks of the town of Barnstead, N. H. In this case, a sampling of "average" pine infection was sought. Two road-blocks were selected in which all pines on parallel road-wide strips run at 10-chain intervals were carefully examined for size and condition of health. In Barnstead the two blocks have not been examined for ribes.

Mr. Newman, the state leader in New Hampshire, is planning to carry on more of these surveys in other towns. One unworked road-block in Middleton, for example, has already been partially surveyed. In future surveys it would seem desirable to make selections from unworked portions of high-priority pine districts. Where practicable, the pine surveys should be followed up by an examination for ribes in order to test the validity of any conclusions that may be drawn.

3. Stripline Survey of Pine Infection on Protected and Unprotected Tracts at Brighton, Maine. (Effectiveness of Control to Reduce Rate of Pine Infection)

A report of heavy damage to merchantable pine at Brighton, Maine, was made by district leader J. M. White. The area was studied to show the extent of blister rust damage to various classes of pine in the absence of control and to demonstrate the effectiveness of ribes eradication under the conditions found at Brighton, Me.

Two road-blocks of pine were scouted. On the basis of this preliminary survey, the pines on 130 chains of road-wide stripline were carefully examined giving a 5% sample of 65 acres. It was found that eradication of the ribes in 1936 had been too late to protect merchantable pine from as much as 52.1% infection. Very young pine, much of it originating since 1936, showed less than 1% infection.

Perhaps it should be pointed out that many abandoned farms now becoming forested with pine are likely to support relatively large quantities of ribes. Proper timing of ribes eradication in such cases will be of material benefit in future protection of pine from blister rust. In several districts of the region studies will be made, from time to time, so that district leaders may be supplied with fresh data to illustrate local conditions with respect to the blister rust control problem.

4. Study of Ribes Bush-Count Data from Control Records of Areas Worked Twice.
(Effectiveness of Control to Reduce Ribes Populations)

Ribes bush-count and acreage data from Northeastern annual reports were reviewed to determine, if possible, the relation between ribes-per-acre found on initial work to the numbers of bushes found on rework areas. Since the figures for all states combined were found to obscure a number of complicating factors the data from one state alone (New Hampshire) were then tried. It was finally decided to visit a number of district offices and to secure data on ribes and acres from road-blocks where the figures were most closely comparable. These data, from five of the six New Hampshire districts, were carefully selected and grouped in various ways.

Grouping the data for bush-counts and acreages was tried in an attempt to show the existence of correlations between figures from initial work and first rework. Chronological order of workings, ribes-per-acre classes found, intervals of time between workings and order of frequency of bush counts are some of the groupings tried.

None of these various groupings revealed clear-cut relationships between the results of initial work and rework. There were, however, certain general trends apparent, such as the obvious reduction of ribes-per-acre by initial work and the failure of ribes on most areas to become equal in numbers to the original population. No marked increase or decrease in initial populations is apparent over the period from 1918 to 1943. It was interesting to note that the largest numbers of ribes-per-acre were destroyed during the period of Emergency Relief Programs.

On the whole, the ribes population seldom is as dense as in the North Central and Western regions but is usually heavier than most parts of the Southern Appalachian region. There are a number of cases where the density of ribes in some New Hampshire road-blocks is not clearly indicated by block-acreage data that have necessarily included, in the divisor, areas free from bushes when computing ribes-per-acre.

The facts gathered together by this study indicate that it should be worthwhile to make a more detailed examination of ribes and acreage data in the Permanent Control Records of other states in the region. Planning of future control work might be benefitted by such a review of past records.

* * * * *

The brief summaries of these surveys and studies are not substitutes for full reports. They are included here to indicate the scope and purpose of such work carried on during the past year. Full reports of these studies are on file and additional work will be conducted along these lines as needed to assure worthwhile results.

PART VII

APPENDIX

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Table 20 - Informational and Service Activities of Permanent and Temporary District Leaders During Period 1923-1943, Inclusive

Informational Activities

State	Meetings Addressed		Items Published	Displays Placed
	Number	Attendance		
Maine	1,336	34,341	591	1,028
N. H.	3,355	194,947	4,207	2,102
Vt.	942	30,614	622	782
Mass.	1,004	42,217	2,152	864
R. I.	251	19,465	408	131
Conn.	101	3,834	645	141
N. Y.	1,845	141,584	2,663	785
Penna.	31	3,480	24	49
All States	8,865	470,432	11,312	5,882

Service Activities

State	Initial Interviews	Follow-Up Calls	Persons Instructed in Field
Maine	31,922	11,369	21,459
N. H.	37,205	35,884	20,947
Vt.	14,667	9,459	10,237
Mass.	34,708	13,106	12,408
R. I.	3,719	3,133	708
Conn.	4,365	3,304	1,627
N. Y.	32,532	23,354	22,603
Penna.	1,471	313	1,284
All States	160,589	99,922	91,273

Table 21 - Local Cooperation on Blister Rust Control Work During 1943

State	Individual Cooperation		Town Cooperation			County Cooperation		
	No. Cooperators (All on Ribes Eradication)	Amount Spent By Individual Cooperators	Appropriations		No. Contributions	Amount Town Money Expended	No. County Allot- ments	Amount Spent By Counties
			Number	Amount				
Maine	-	-	53	\$10,005.00	-	\$8,361.90	-	-
N. H.	1	\$398.40	17	4,525.00	-	2,074.86	-	-
Vt.	2	76.10	12	2,550.00	-	2,255.25	-	-
Mass.	32	233.16	-	-	5	780.72	-	-
Conn.	7	72.95	14	2,648.00	-	424.60	-	-
N. Y.	5	125.95	10	5,550.00	-	3,503.49	6	\$7,552.88
All States	47	\$906.56	106	\$25,278.00	5	\$17,400.82	6	\$7,552.88

Table 22 - Local Cooperation on Blister Rust Control Work During Period 1918-1943, Inclusive

State	Individual Cooperation			Town Cooperation			County Cooperation	
	No. Cooperators		Amount Spent By Individual Cooperators	No. Town		Amount Town Money Expended	No. County Allotments	Amount Spent By Counties
	Ribes Eradication	Canker Elimination		Appropriations	Contributions			
Maine	11,103	24	\$85,270.18	842	20	\$141,284.42	-	-
N. H.	692	-	49,002.07	1,451	20	436,681.29	6	\$1,724.08
Vt.	2,349	12	74,942.88	26	64	26,137.61	-	-
Mass.	21,782	-	101,424.68	4	52	23,956.62	-	-
R. I.	8	-	531.36	-	-	-	-	-
Conn.	506	-	9,954.19	53	51	27,797.45	-	-
N. Y.	5,969	1	174,459.65	15	3	6,714.12	59	59,307.47
Penna.	302	-	2,193.68	-	-	-	-	-
All States	42,711	37	\$497,828.69	2,390	210	\$662,571.51	65	\$61,031.55

Data for Tables 21 and 22 do not include value of cultivated ribes destroyed.

Table 23 - Control Area Mapping Work During 1943

(all work on state and private lands)

State	Program	Acreage Mapped	Acreage Examined But Not Mapped	Miles Control Area Boundary Lines Painted	Total Man Days
N. H.	All Regular	5,874	-	-	170
Vt.	"	3,332	1,950	-	21
Mass.	"	21,132	26,949	-	63
R. I.	"	4,735	4,368	-	63
Conn.	"	3,131	27,841	-	35
N. Y.	"	9,877	41,715	-	333
Penna.	All W.P.A.	1,393	-	19	68
All States	Regular	48,081	102,823	-	685
	W.P.A.	1,393	-	19	68
	Total	49,474	102,823	19	753

Table 24 - Control Area Mapping Work During Period 1933-1943, Inclusive

By States

State	Total Acreage Reported Mapped	Acreage Detail Mapped in Net Control Area	Acreage Examined But Not Mapped	Miles Control Area Boundary Lines Painted	Total Man Days
Maine	2,289,913	2,090,420	4,762,969	1,808½	37,476
N. H.	1,481,201	1,429,085	259,702	-	40,958
Vt.	1,664,961	765,077	4,010,625	828	23,151
Mass.	974,192	888,386	1,209,106	1,290	20,769
R. I.	230,395	120,326	4,368	-	2,327
Conn.	732,019	494,961	2,639,160	3,202½	25,203
N. Y.	4,287,819	1,952,866	2,908,914	2,399	44,115
Penna.	802,306	651,713	-	7,369	45,183
All States	12,462,806	8,392,834	15,794,844	16,896½	239,182

Table 25 - Control Area Mapping Work During Period 1933-1943, Inclusive

By Programs

Program	Total Acreage Reported Mapped	Acreage Examined But Not Mapped	Miles Control Area Boundary Lines Painted	Total Man Days
Regular Cooperative	563,012	737,497	-	3,235
C.C.C.	999,838	364,002	2,630	38,265
P.W.A.	744,663	942,528	227	6,915
W.P.A. (F.A.)	9,239,070	11,177,457	10,678½	159,244
W.P.A. (State)	656,491	399,852	3,361½	26,676
E.R.A.	213,971	2,139,370	-	4,205
C.W.A.	45,761	34,138	-	592
All Programs	12,462,806	15,794,844	16,896½	239,182

Table 26 - Status of Control Area Mapping Work - December 31, 1943

State	Total Acreage of Net Control Area	Acreage Detail Mapped in Net Control Area	% Net Control Area Detail Mapped
Maine	2,502,241	2,090,420	83.5
N. H.	3,153,985	1,429,085	45.3
Vt.	793,310	765,077	96.4
Mass.	1,833,267	888,386	48.5
R. I.	181,595	120,326	66.3
Conn.	494,961	494,961	100.0
N. Y.	2,917,333	1,952,866	66.9
N. J.	16,742	-	-
Penna.	816,314	651,713	79.8
All States	12,709,748	8,392,834	66.0

Table 27- Ribes Eradication Work During 1943 By States and Land Ownership Classes

(all work conducted under Regular Cooperative Program)

State	Land Ownership Class	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
				Wild	Cult.		Man Days	Rib
Maine	State and Private	Initial	16,694	227,785	369	1,486	.09	13.7
		Re-Erad.	67,957	461,914	144	4,082	.06	6.8
		Total	84,651	689,699	513	5,568	.07	8.2
	Acadia National Park	All Re-Erad.	1,609	20,744	1	506	.31	12.9
	Total	Initial	16,694	227,785	369	1,486	.09	13.7
		Re-Erad.	69,566	482,658	145	4,588	.07	6.9
		Total	86,260	710,443	514	6,074	.07	8.6
N. H.	State and Private	Initial	5,427	165,270	-	729	.13	30.5
		Re-Erad.	13,645	180,387	-	2,179	.16	13.2
		Total	19,072	345,657	-	2,908	.15	18.1
	White Mt. National Forest	All Re-Erad.	3,082	727	-	73	.02	0.2
	Total	Initial	5,427	165,270	-	729	.13	30.5
		Re-Erad.	16,727	181,114	-	2,252	.13	10.8
		Total	22,154	346,384	-	2,981	.13	15.6
Vt.	All State and Private	Initial	8,939	86,014	42	751	.08	6.4
		Re-Erad.	5,352	32,432	33	536	.10	5.2
		Total	14,291	118,496	75	1,287	.09	8.3
Mass.	"	Initial	4,711	12,438	52	279	.06	2.7
		Re-Erad.	40,992	75,110	594	1,920	.05	1.8
		Total	45,703	87,548	646	2,199	.05	1.9
R. I.	"	All Re-Erad.	6,171	2,326	-	497	.08	0.4
Conn.	"	"	17,547	89,401	-	1,309	.07	5.1
N. Y.	"	Initial	43,190	579,647	817	4,709	.11	13.4
		Re-Erad.	109,294	463,394	309	6,918	.06	4.2
		Total	152,484	1,043,041	1,126	11,627	.08	6.8
Penna.	"	Initial	13,967	76,862	507	954	.07	5.5
		Re-Erad.	10,150	97,134	-	490	.05	9.6
		Total	24,117	173,996	507	1,444	.06	7.2
All States	State and Private	Initial	92,928	1,148,016	1,787	8,908	.095	12.4
		Re-Erad.	271,108	1,402,143	1,030	17,931	.07	5.2
		Total	364,036	2,550,164	2,817	26,839	.07	7.0
	National Park	All Re-Erad.	1,609	20,744	1	506	.31	12.9
	National Forest	"	3,082	727	-	73	.02	0.2
	All	Initial	92,928	1,148,016	1,787	8,908	.095	12.4
		Re-Erad.	275,799	1,423,619	1,031	18,510	.07	5.2
		Total	368,727	2,571,635	2,868	27,418	.07	7.0

Table 28 - Ribes Eradication Work, 1918-1943, InclusiveBy States

State	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild	Cult.		Man Days	Ribes
Maine	Initial	2,368,123	45,924,331	137,931	253,264	.11	19.5
	Re-Erad.	803,340	12,611,972	14,835	138,052	.17	15.7
	Total	3,171,463	58,536,303	152,766	391,316	.12	18.5
N. H.	Initial	3,182,500	56,522,363	152,644	299,687	.09	17.8
	Re-Erad.	939,094	12,052,774	6,260	113,749	.12	12.8
	Total	4,121,594	68,575,137	158,904	413,436	.10	16.7
Vt.	Initial	500,578	11,768,575	15,705	119,927	.24	23.5
	Re-Erad.	160,065	2,788,424	2,225	43,744	.27	17.4
	Total	660,643	14,556,999	17,930	163,671	.25	22.1
Mass.	Initial	2,034,508	16,551,444	257,975	128,898	.06	8.3
	Re-Erad.	1,099,525	5,812,587	24,951	91,938	.08	5.3
	Total	3,134,033	22,364,031	282,926	220,836	.07	7.2
R. I.	Initial	329,347	255,813	13,689	21,213	.06	0.8
	Re-Erad.	317,397	367,662	10,008	54,378	.17	1.2
	Total	646,744	623,475	23,697	75,591	.12	1.0
Conn.	Initial	443,288	2,466,403	29,317	39,722	.09	5.6
	Re-Erad.	479,879	4,886,588	10,362	94,666	.20	10.2
	Total	923,167	7,352,991	39,679	134,388	.15	8.0
N. Y.	Initial	2,583,090	62,539,406	125,125	693,613	.27	24.3
	Re-Erad.	1,064,546	10,592,422	14,002	188,964	.18	10.0
	Total	3,647,636	73,131,828	139,127	882,577	.24	20.1
N. J.	Initial	16,742	47,780	1,713	1,324	.08	3.0
	Re-Erad.	1,417	16,956	15	392	.28	12.0
	Total	18,159	64,736	1,728	1,716	.09	3.7
Penn.	Initial	622,409	32,911,826	51,661	321,148	.52	53.0
	Re-Erad.	234,638	5,599,889	3,121	157,203	.67	23.9
	Total	857,047	38,511,715	54,782	478,351	.56	45.0
All States	Initial	12,080,585	228,987,941	785,760	1,878,796	.16	19.0
	Re-Erad.	5,099,901	54,729,274	85,779	883,086	.17	10.7
	Total	17,180,486	283,717,215	871,539	2,761,882	.16	16.6

The data for Table 28 were compiled from the state leaders' annual statistical reports. In 1937 and 1942, certain adjustments were made in the acreage figures for Maine, Vermont and Connecticut in order to make the data agree with the permanent CO-105 records. The details of these adjustments are given on Page 78 of the 1942 annual report for the Northeastern Region.

Table 29 - Ribes Eradication Work, 1918-1943, Inclusive

By Programs

Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild	Cult.		Man Days	Ribes
Regular Cooperative	Initial	8,412,165	104,858,210	612,431	675,609	.08	12.5
	Re-Erad.	2,115,575	11,948,812	26,292	135,152	.06	5.7
	Total	10,527,740	116,807,022	638,723	810,761	.08	11.2
C.C.C.	Initial	1,380,051	49,796,551	75,026	684,302	.50	36.1
	Re-Erad.	1,200,463	16,666,472	18,368	453,609	.38	13.9
	Total	2,580,514	66,463,023	93,394	1,137,911	.44	25.8
S.C.S.	Initial	20,451	651,444	360	9,944	.49	31.9
	Re-Erad.	10,120	18,830	-	2,485	.25	1.9
	Total	30,571	670,274	360	12,429	.41	21.9
W.P.A. (F.A.)	Initial	1,927,319	63,977,156	85,141	455,305	.24	33.2
	Re-Erad.	1,479,143	23,753,574	32,843	258,265	.17	16.1
	Total	3,406,467	87,730,730	117,984	713,570	.21	25.8
W.P.A. (State)	Initial	90,665	1,754,811	2,892	11,827	.13	19.4
	Re-Erad.	154,784	794,861	2,427	13,310	.09	5.2
	Total	245,449	2,549,672	5,319	25,137	.10	10.4
P.W.A.	Initial	179,970	7,639,253	7,297	33,419	.19	42.5
	Re-Erad.	162,541	1,368,399	5,379	16,156	.10	8.5
	Total	342,511	9,007,652	12,676	49,575	.14	26.3
C.W.A. and E.R.A.	Initial	20,547	174,137	1,600	4,500	.22	8.6
	Re-Erad.	7,704	158,586	306	3,270	.42	20.6
	Total	28,251	332,723	1,906	7,770	.28	11.8
A.R.A.	Initial	10,639	112,491	948	3,564	.33	10.7
	Re-Erad.	5,714	13,779	110	772	.14	2.4
	Total	16,353	126,270	1,058	4,336	.27	7.8
N.Y.A.	Initial	373	4,280	-	85	.23	11.5
	Re-Erad.	555	4,741	-	31	.06	8.5
	Total	928	9,021	-	116	.13	9.7
N.V.S.	Initial	1,416	19,608	65	241	.17	13.9
	Re-Erad.	286	1,220	54	36	.13	4.5
	Total	1,702	20,828	119	277	.16	12.3
All Programs	Initial	12,043,596	228,987,941	785,760	1,878,796	.16	19.1
	Re-Erad.	5,136,890	54,729,274	85,779	883,086	.17	10.7
	Total	17,180,486	283,717,215	871,539	2,761,882	.16	16.6

In Table 29 summarizing the eradication work by programs, it was not possible to make some of the adjustments in the gross acreages reported worked which are indicated in the footnote for Table 28.

Table 30 - Ribes Eradication Work, 1918-1943, Inclusive

By Land Ownership Classes

Land Ownership Class		Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre		
				Wild	Cult.		Man Days	Ribes	
State and Privately Owned Lands		Initial	12,041,959	226,432,196	785,352	1,860,746	.15	18.9	
		Re-Erad.	5,075,171	54,285,741	85,778	876,420	.17	10.7	
		Total	17,117,130	280,717,937	871,130	2,737,166	.16	16.5	
National Forests	White Mountain	Initial	8,729	816,274	85	2,879	.33	93.5	
		Re-Erad.	12,060	324,805	-	1,989	.16	26.9	
		Total	20,789	1,141,079	85	4,868	.23	54.9	
	Allegheny	Initial	4,381	770,824	30	2,626	.60	176.0	
		Re-Erad.	1,406	62,759	-	587	.42	44.6	
		Total	5,787	833,583	30	3,213	.56	144.0	
	Total	Initial	13,110	1,587,098	115	5,505	.42	121.1	
		Re-Erad.	13,466	387,564	-	2,576	.19	28.8	
		Total	26,576	1,974,662	115	8,081	.30	74.3	
	National Parks	Acadia	Initial	20,716	893,647	293	11,227	.54	43.2
			Re-Erad.	11,264	55,969	1	4,090	.36	5.0
			Total	31,980	949,616	294	15,317	.48	29.7
Hickory Run Dem. Area		Initial	4,800	75,000	-	1,318	.27	15.6	
		Re-Erad.	-	-	-	-	-	-	
		Total	4,800	75,000	-	1,318	.27	15.6	
Total		Initial	25,516	968,647	293	12,545	.49	38.0	
		Re-Erad.	11,264	55,969	1	4,090	.36	5.0	
		Total	36,780	1,024,616	294	16,635	.45	27.9	
All Classes		Initial	12,080,585	228,987,941	785,760	1,878,796	.16	19.0	
		Re-Erad.	5,099,901	54,729,274	85,779	883,086	.17	10.7	
		Total	17,180,486	283,717,215	871,539	2,761,882	.16	16.6	

Table 31 - Status of Ribes Eradication Work - December 31, 1943

By States

State	Total Acreage of Net Control Area	Acreage of White Pine in Net Control Area	Acreage Worked in Net Control Area			Acreage in Net Control Area Now On Maintenance Basis	Percentage of Net Control Area			
			Initial	1st Rework	2nd Rework		Initially Worked	Reworked Once	Reworked Twice	Now on Main- tenance
Maine	2,502,241	963,476	2,139,919	794,323	29,538	175,644	85.5	31.7	1.2	7.0
N. H.	3,153,985	1,354,333	2,869,619	842,745	42,487	278,986	91.0	26.7	1.3	8.8
Vt.	793,310	164,583	443,077	141,629	10,924	68,869	55.9	17.9	1.4	8.7
Mass.	1,833,267	646,662	1,798,528	907,791	100,381	769,073	98.1	49.5	5.5	42.0
R. I.	181,595	74,496	180,419	152,330	20,763	180,419	99.4	83.9	11.4	99.4
Conn.	494,961	79,883	494,171	325,080	43,886	484,385	99.8	65.7	8.9	97.9
N. Y.	2,917,333	830,507	2,317,528	920,050	171,746	399,042	79.4	31.5	5.9	13.7
N. J.	16,742	3,771	16,742	1,417	0	16,742	100.0	8.5	-	100.0
Penna.	816,314	144,323	565,542	129,917	32,189	60,550	69.3	15.9	3.9	7.4
All States	12,709,748	4,262,034	10,825,545	4,215,282	451,914	2,433,710	85.2	33.2	3.6	19.1

By Land Ownership Classes

State and Private Lands	12,678,954	4,255,838	10,796,649	4,200,620	449,967	2,419,133	85.2	33.1	3.5	19.1
National Forests	9,544	2,278	7,646	3,398	1,947	0	80.1	35.6	20.4	0
National Parks	21,250	3,918	21,250	11,264	0	14,577	100.0	53.0	-	68.6
Totals	12,709,748	4,262,034	10,825,545	4,215,282	451,914	2,433,710	85.2	33.2	3.6	19.1

Table 32 - STATUS OF BLISTER RUST CONTROL WORK IN PERMANENT CONTROL AREA
IN NORTHEASTERN STATES BY STATES AND DISTRICTS
(December 31, 1943)

State	District	Total Acreage of Net Control Area	Acreage of White Pine in Net Control Area	Acreage in Net Control Area That Has Been Detail Mapped	Acreage in Net Control Area Initially Worked	Acreage in Net Control Area Reworked		Estimated Acreage in Net Control Area Still Needing Re-examination at End of 1943	Acreage in Net Control Area Now on Maintenance Basis	Percentage of Net Control Area						
						1st Rework	2nd Rework			Detail Mapped	Initially Worked	Reworked Once	Reworked Twice	On Main- tenance	Now Needing Initial Work	Re-exam- ination
Maine	Bradbury	347,939	87,907	312,048	237,811	51,375	3,835	117,566	38,887	89.7	68.3	14.8	1.1	11.2	31.7	33.8
	Calderara	797,093	319,501	697,251	714,023	274,966	11,657	434,781	28,161	87.5	89.6	34.5	1.5	3.5	10.4	54.5
	Curtis	835,672	403,577	611,049	829,806	350,353	2,352	447,138	74,180	69.0	93.7	39.6	0.3	8.4	6.3	50.5
	White	471,537	152,491	470,072	353,279	117,629	11,694	231,008	34,416	99.7	76.0	24.9	2.5	7.3	24.0	49.0
	Totals For State	2,502,241	963,476	2,090,420	2,139,919	794,323	29,538	1,230,493	175,644	83.5	85.5	31.7	1.2	7.0	14.5	49.2
New Hampshire	Baker	605,607	270,761	204,023	567,419	169,259	4,525	391,532	232	33.7	93.7	27.9	0.7	0.04	6.3	64.6
	Boomer	353,253	129,573	343,494	337,545	108,077	6,152	205,928	2,216	97.2	95.6	30.6	1.7	0.6	4.4	58.3
	Codman	268,605	110,997	211,400	253,167	74,235	837	143,789	0	78.7	94.3	27.6	0.3	0	5.7	53.5
	King	795,739	395,333	295,664	736,719	236,708	17,079	486,274	81,929	37.2	92.6	29.7	2.1	10.3	7.4	61.1
	Richardson	398,008	158,580	250,448	302,683	74,510	0	225,697	13,906	62.9	76.0	18.7	0	3.5	24.0	56.7
Vermont	Newman	732,773	289,089	124,051	672,036	179,956	13,894	430,816	180,703	16.9	91.7	24.6	1.9	24.7	8.3	65.6
	Totals For State	3,153,935	1,354,333	1,429,085	2,869,619	842,745	42,437	1,934,036	278,986	45.3	91.0	26.7	1.3	8.8	9.0	61.3
	Mulholland	260,118	51,707	260,118	132,762	70,116	1,909	79,702	6,440	100.0	51.0	27.0	0.7	2.5	49.0	30.6
	Palmer	222,359	43,141	218,379	124,143	20,872	2,771	57,369	50,165	98.2	55.8	9.4	1.2	22.6	44.2	25.8
	Rose	310,833	64,735	286,580	186,172	50,641	6,244	42,119	12,264	92.2	59.9	16.3	2.0	3.9	40.1	13.6
Mass.	Totals For State	793,310	164,583	765,077	443,077	141,629	10,924	179,190	68,869	96.4	55.9	17.9	1.4	8.7	44.1	22.6
	Brockway	847,857	319,316	320,395	843,309	493,616	22,081	220,158	609,514	37.8	99.5	58.3	2.6	71.9	0.5	26.0
	Clave	422,597	157,873	189,719	403,721	69,307	1,201	317,860	0	44.9	95.5	16.4	0.3	0	4.5	75.2
	Doore	288,124	74,350	144,380	282,851	135,344	27,681	117,886	42,774	50.1	98.2	47.0	9.6	14.8	1.8	40.9
	Wheeler	274,689	94,613	233,892	268,647	204,524	49,418	61,003	116,785	85.1	97.8	74.5	13.0	42.5	2.2	22.2
R. I.	Totals For State	1,833,267	646,662	883,386	1,798,528	907,791	100,381	716,907	769,073	48.5	98.1	49.5	5.5	42.0	1.9	39.1
	White	181,595	74,496	120,326	180,419	152,330	20,763	0	180,419	66.3	99.4	33.9	11.4	99.4	0.6	0
Conn.	Miller (Litchfield Co.)	151,634	27,183	151,634	151,634	129,281	27,321	9,786	141,848	100.0	100.0	85.3	18.0	93.5	0.0	6.4
	Remainder of State	343,327	52,700	343,327	342,537	195,799	16,565	0	342,537	100.0	99.8	57.0	4.8	99.8	0.2	0.0
	Totals For State	494,961	79,833	494,961	494,171	325,080	43,386	9,786	484,385	100.0	99.8	65.7	8.9	97.9	0.2	2.0
	Barber	433,793	137,951	413,747	334,208	176,894	35,422	109,318	7,294	95.4	77.0	40.8	8.2	0	23.0	25.2
	Charlton	170,218	50,748	142,839	137,185	57,651	11,362	59,009	31,535	83.9	80.6	33.9	6.7	4.3	19.4	34.7
New York	Harpp	232,035	96,308	226,635	232,035	152,477	31,535	95,295	18,835	97.7	100.0	65.7	13.6	13.6	0.0	41.1
	Holcomb	235,943	60,638	180,251	217,567	112,941	22,170	81,300	13,835	76.4	92.2	47.9	9.4	8.0	7.8	34.4
	Kreage	329,310	153,155	319,158	296,556	100,712	23,471	190,502	27,105	96.9	90.1	30.6	7.1	8.2	9.9	57.8
	McCasland	277,676	62,081	276,261	230,579	86,156	9,410	119,393	24,556	99.5	83.0	31.0	3.4	8.8	17.0	43.0
	Strait	611,509	143,986	312,103	430,934	93,919	15,488	111,982	227,038	51.0	78.6	15.4	2.5	37.2	21.4	18.3
Penn.	Woolschlager	210,239	55,727	70,964	200,673	75,114	22,838	130,870	21,520	33.8	95.4	35.7	10.9	10.2	4.6	62.2
	Counties Outside Present Districts	416,610	69,913	10,908	187,791	64,136	0	108,359	41,109	2.6	45.1	15.4	0	9.9	54.9	26.0
	Totals For State	2,917,333	830,507	1,952,866	2,317,528	920,050	171,746	1,006,028	399,042	66.9	79.4	31.5	5.9	13.7	20.6	34.5
	DeBerti	140,011	21,688	106,858	89,030	13,073	5,532	55,463	28,753	76.3	63.6	9.3	4.0	20.5	36.4	39.6
	Simmonds	181,692	29,733	133,359	99,090	10,206	1,083	40,075	9,901	73.4	54.5	5.6	0.6	5.4	45.5	22.0
N. J.	Counties Outside Present Districts	494,611	92,902	411,496	377,422	106,638	25,574	164,517	21,896	83.2	76.3	21.6	5.2	4.4	23.7	33.3
	Totals For State	816,314	144,323	651,713	565,542	129,917	32,189	260,055	60,550	79.8	69.3	15.9	3.9	7.4	30.7	31.8
	White	16,742	3,771	0	16,742	1,417	0	0	16,742	0	100.0	8.5	0	100.0	0	0
All States		12,709,748	4,262,034	8,392,834	10,825,545	4,215,282	451,914	5,336,495	2,433,710	66.0	85.2	33.2	3.6	19.1	14.8	42.0

1	100	100	100
2	100	100	100
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90	100	100	100
91	100	100	100
92	100	100	100
93	100	100	100
94	100	100	100
95	100	100	100
96	100	100	100
97	100	100	100
98	100	100	100
99	100	100	100
100	100	100	100

Table 33 - Nursery Sanitation Work During 1943

(All work conducted under Regular Cooperative Program)

State	No. Nurseries Worked	Est.No.White Pines in Nurseries Worked	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
					Wild	Cult.		Man Days	Ribes
Conn.	7	1,353,500	Initial	100	5	-	1	.01	.05
			Re-Erad.	2,561	15	5	17	.006	.007
			Total	2,661	20	5	18	.006	.01
N. Y.	3	33,271,300	Re-Erad.	2,980	447	-	35	.011	.15
Penna.	3	1,202,000	"	1,251	147	1	27	.021	.12
All States	13	35,826,800	Initial	100	5	-	1	.01	.05
			Re-Erad.	6,792	609	6	79	.011	.09
			Total	6,892	614	6	80	.011	.09

Initial work in Connecticut involved extension of sanitation zone around one nursery which was reworked during 1943.

Table 34 - Nursery Sanitation Work, 1930-1943, Inclusive
By States

State	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild	Cult.		Man Days	Ribes
Maine	Initial	206	103,516	22	163	.79	502.6
	Re-Erad.	1,529	10,819	-	300	.20	7.1
	Total	1,735	114,335	22	463	.27	65.9
N. H.	All Re-Erad.	2,762	7,824	1	283	.10	2.8
Vt.	All Re-Erad.	2,230	4,839	75	409	.13	2.2
Mass.	Initial	723	30,369	112	139	.19	42.2
	Re-Erad.	7,310	19,194	182	1,114	.15	2.7
	Total	8,033	49,563	294	1,253	.16	6.2
R. I.	Initial	1,780	160	565	167	.09	0.4
	Re-Erad.	18,156	4,786	134	277	.02	0.3
	Total	19,936	4,946	749	444	.02	0.3
Conn.	Initial	7,566	16,529	165	298	.04	2.2
	Re-Erad.	60,038	17,781	980	2,477	.04	0.3
	Total	67,604	34,310	1,145	2,775	.04	0.5
N. Y.	Initial	3,735	30,924	655	424	.11	8.5
	Re-Erad.	102,336	132,632	1,246	5,991	.06	1.3
	Total	106,071	163,556	1,901	6,415	.06	1.6
N. J.	Initial	795	2,000	114	109	.14	2.7
	Re-Erad.	870	765	-	18	.02	0.9
	Total	1,665	2,765	114	127	.08	1.7
Penna.	Initial	4,414	38,460	494	343½	.08	8.8
	Re-Erad.	24,698	53,930	72	4,126½	.17	2.2
	Total	29,112	92,390	566	4,470	.15	3.2
All States	Initial	19,219	221,958	2,127	1,643½	.09	11.7
	Re-Erad.	219,929	252,570	2,740	14,995½	.07	1.2
	Total	239,148	474,528	4,867	16,639	.07	2.0

(No separate record was kept of the special nursery sanitation work prior to 1930, the results of such activities from 1913-1929 being included in the regular ribes eradication summaries.)

Table 35 - Nursery Sanitation Work, 1930-1943, Inclusive

By Programs

Program	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild	Cult.		Man Days	Ribes
Regular Cooperative	Initial	16.899	189.657	1.943	1,291½	.08	11.4
	Re-Erad.	145.887	179.779	2.510	7.807	.05	1.2
	Total	162.786	369.436	4.453	9.098½	.06	2.3
P.W.A.	Initial	415	25.597	3	147	.35	61.7
	Re-Erad.	15.422	14.285	96	1.356	.09	0.9
	Total	15.837	39.882	99	1.503	.09	2.5
C.C.C.	Initial	280	232	47	33	.12	1.0
	Re-Erad.	11.592	45.509	14	3.699	.32	3.9
	Total	11.872	45.741	61	3.732	.31	3.9
W.P.A. (F.A.)	Initial	590	27	45	9	.01	0.1
	Re-Erad.	29.908	11.543	119	1.742	.06	0.4
	Total	30.498	11.570	164	1.751	.06	0.4
W.P.A. (State)	All Re-Erad.	4,117	492	-	300	.07	0.1
S.C.S.	Initial	1.035	6.445	89	163	.16	6.3
	Re-Erad.	13.003	962	1	91½	.01	0.1
	Total	14.038	7.407	90	254½	.02	0.5
All Programs	Initial	19.219	221.958	2,127	1,643½	.09	11.7
	Re-Erad.	219.929	252.570	2,740	14,995½	.07	1.2
	Total	239.148	474.528	4,867	16,639	.07	2.0

Table 36 - Status of Nursery Sanitation Work - December 31, 1943

State	Nurseries Where Protection Established and Being Maintained				Maximum Acreage of Control Area	Number Nurseries Protected During 1943	No. Additional Nurseries Which Established Zones But Now Abandoned
	Number						
	Federal	State	Private	Total			
Maine	-	1	1	2	409	-	5
N. H.	-	1	1	2	749	-	1
Vt.	-	1	-	1	700	-	-
Mass.	-	4	6	10	8,210	-	9
R. I.	-	-	1	1	770	-	5
Conn.	-	2	5	7	2,661	7	14
N. Y.	-	3	-	3	3,720	3	6
N. J.	-	1	-	1	600	-	1
Penna.	1	4	4	9	4,136	3	5
All States	1	17	18	36	21,955	13	46

Table 37 - List of Nurseries Maintaining Sanitation Zones in Northeastern States
(December 31, 1943)

	<u>Acreage of Sanitation Zone</u>
<u>Maine</u>	
Western Maine Nursery - Fryeburg, Maine	247
State Nursery - Orono, Maine	162
	<u>409</u>
<u>New Hampshire</u>	
Keene Forestry Associates - Keene, N. H.	250
State Nursery - Boscawen, N. H.	499
	<u>749</u>
<u>Vermont</u>	
State Nursery - Essex Junction, Vt.	700
<u>Massachusetts</u>	
Department of Conservation Nursery - Amherst, Mass.	225
Department of Conservation Nursery - Bridgewater, Mass.	100
Department of Conservation Nursery - Clinton, Mass.	150
Department of Conservation Nursery - Erving, Mass.	50
Franklin Forestry Company - Shelburne Falls, Mass.	435
Kelsey Highlands Nursery - Boxford, Mass.	900
Little Tree Farms Nursery - Framingham, Mass.	725
Wyman Nursery - Framingham, Mass.	1,000
Littlefield-Wyman Nursery - No. Abington, Mass.	} 4,625
Bay State Nursery - Abington, Mass.	
	<u>8,210</u>
<u>Rhode Island</u>	
Rhode Island Nursery (private) - Middleton, R. I.	770
<u>Connecticut</u>	
Elfgren Nursery - East Killingly, Conn.	280
Northeastern Forestry Company - Cheshire, Conn.	537
A. N. Pierson, Inc. - Cromwell, Conn.	355
State Nursery - Barkhamstead, Conn.	456
State Nursery - Tolland, Conn.	365
Sun Valley Nursery - New Milford, Conn.	480
Great Pond Nursery - Simsbury, Conn.	188
	<u>2,661</u>
<u>New York</u>	
State Nursery - Saratoga Springs, N. Y.	2,310
State Nursery - Lowville, N. Y.	1,150
New York State College of Forestry Nursery -	
Syracuse, N. Y.	260
	<u>3,720</u>

Table 37 - List of Nurseries Maintaining Sanitation Zones in Northeastern States (Continued)
(December 31, 1943)

	<u>Acreage of Sanitation Zone</u>
<u>New Jersey</u>	
State Nursery - Washington Crossing, N. J.	600
<u>Pennsylvania</u>	
Clearfield State Nursery - Clearfield, Penna.	370
Greenwood State Nursery - Petersburg, Penna.	411
Mt. Alto State Nursery - Mt. Alto, Penna.	366
Rockview State Nursery - Pleasant Gap, Penna.	354
S. C. S. Nursery - Mt. Eagle, Penna.	215
Wilmore Realty Co. Nursery - Windber, Penna.	215
Andorra Nursery - Chester Hill, Penna.	1,065
Fairview Nursery - Fairview, Penna.	559
Doyle Nursery - Seven Stars, Penna.	581
	<u>4,136</u>

Table 38 - Special Ribes Nigrum Elimination Work, 1925-1943, InclusiveBy States

State	No. Properties Inspected	No. Patches Located	No. Ribes Destroyed			Total Man Days
			Nigrum	Other Cult.	Total	
Mass.	750,359	6,657	42,629*	432	43,061	7,347
R. I.	110,137	1,917	16,219	1,093	17,312	1,929
Conn.	318,344	32,695**	7,464	42,397	49,861	14,610
N. Y.	526,593	5,128	37,064	761	37,825	5,250
All States	1,705,433	46,397	103,376	44,683	148,059	29,136

*Includes 556 bushes pulled in connection with special black currant elimination project around nurseries in 1925 and 1926.

**The survey in Connecticut included all cultivated ribes. It is estimated that the number of black currant patches in that state did not exceed 1500.

Table 39 - Special Ribes Nigrum Elimination Work, 1928-1943, InclusiveBy Programs

Program	No. Properties Inspected	No. Patches Located	No. Ribes Destroyed			Total Man Days
			Nigrum	Other Cult.	Total	
Regular Cooperative	1,082,878	14,227	85,624	20,550	106,174	14,155
P.W.A.	6,157	39	7,486	-	7,486	375
W.P.A.(F.A.)	180,313	869	3,156	432	3,588	1,031
C.W.A.	195,750	5,404	-	-	-	1,850
E.R.A.	240,335	25,858	7,110	23,701	30,811	11,675
All Programs	1,705,433	46,397	103,376	44,683	148,059	29,136

C.W.A. project consisted of location work only.

Table 40 - Status of Special Ribes Nigrum Elimination Work - December 31, 1943

State	Years Work Performed	Total Number Townships in State	No. Townships Where Special Black Currant Elimination Work	
			Completed	Partially Completed
Mass.	1930-1940, Incl.	355	346*	-
R. I.	1929-1933 "	39	39	-
Conn.	1930-1935 "	169	169	-
N. Y.	1928-1940 "	996	236	39
All States	-	1,559	790	39

*Nine additional townships on islands next to mainland will not be worked.

In the other states, Ribes nigrum have been eradicated in the worked portions of the control areas in conjunction with regular control activities. Very few black currants have been found in these states.

Table 41 - State Compensation Paid For Cultivated Ribes
Destroyed During Period 1918-1943, Inclusive

State	Total No. Cult. Ribes Destroyed	No. Bushes Paid For	% Bushes Paid For	No. Persons Paid Compensation	Amount Paid in Reimbursement	Average Amount Paid Per Bush
Maine	152,788	0	-	0	0	-
N. H.	158,905	2,008	1.3	63	\$550.60	\$.274
Vt.	18,005	1,646	9.1	133	792.91	.482
Mass.	326,281	42,074	12.9	673	15,020.15	.357
R. I.	41,758	1,410	3.4	58	509.79	.362
Conn.	90,685	175	0.2	16	103.50	.591
N. Y.	178,853	16,338	9.1	1,151	5,587.99	.342
N. J.	1,842	0	-	0	0	-
Penna.	55,348	513	0.9	70	167.25	.326
All States	1,024,465	64,164	6.3	2,164	\$22,732.19	\$.354

No federal money has been paid for ribes compensation.

As indicated in Table 41, no compensation has been paid for the 152,788 cultivated ribes destroyed in Maine during the period 1918-1943, inclusive.

Table 41 includes 294 cultivated bushes removed in connection with control activities at Acadia National Park, and 115 cultivated ribes destroyed on control projects on National Forest lands. No compensation was paid for such bushes removed from the control areas on these federal land projects.

Table 42 - Blistar Rust Canker Elimination Work During 1943

(All work on state or municipally-owned lands)

State	Program	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	No. Cankers Removed		Total Man Days
					Branch	Stem	
Vt.	Regular	5,000	175	20	30	-	16
N. Y.	"	2,450	18	10	18	-	10
	W.P.A. (State)	1,578	214	100	135	-	43
	Total	4,028	232	110	153	-	53
All States	Regular	7,450	193	30	48	-	26
	W.P.A. (State)	1,578	214	100	135	-	43
	Total	9,028	407	130	183	-	69

Table 43 - Blister Rust Canker Elimination Work, 1932-1943, InclusiveBy States and Programs

State	Program	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	No. Cankers Removed		Total Man Days
					Branch	Stem	
Maine	Regular	97,748	8,267	12,804	19,512	1,923	811
	C.C.C.	58,261	2,957	8,879	27,054	2,691	2,177
	Total	156,009	11,224	21,683	46,566	4,614	2,988
N. H.	All W.P.A. (F.A.)	28,581	5,731	638	711	-	219
Vt.	Regular	24,647	1,597	1,765	2,891	225	189
	W.P.A. (F.A.)	226,489	38,342	18,838	21,030	223	2,491
	W.P.A. (State)	21,457	985	786	895	-	367
	Total	272,593	40,924	21,389	24,816	448	3,047
Mass.	W.P.A. (F.A.)	116,167	14,956	3,682	4,107	7	3,293
	C.W.A.	4,648,000	17,303	12,784	17,511	-	5,409
	Total	4,764,167	32,259	16,466	21,618	7	8,702
N. Y.	Regular	2,450	18	10	18	-	10
	W.P.A. (F.A.)	1,577,875	149,379	190,702	253,287	1,789	12,420
	W.P.A. (State)	324,770	8,868	7,571	8,105	152	1,516
	Total	1,905,095	158,265	198,283	261,410	1,941	13,946
Penna.	C.C.C.	567,018	28,308	76,048	458,455	67	4,564
	W.P.A. (F.A.)	352,460	4,287	53,927	108,470	1,907	2,742
	Total	919,478	32,595	129,975	566,925	1,974	7,306
All States	Regular	124,845	9,882	14,579	22,421	2,148	1,010
	C.C.C.	625,279	31,265	84,927	485,509	2,753	6,741
	W.P.A. (F.A.)	2,301,572	212,695	267,787	387,605	3,926	21,165
	W.P.A. (State)	346,227	9,853	8,357	9,000	152	1,886
	C.W.A.	4,648,000	17,303	12,784	17,511	-	5,409
	Total	8,045,923	280,998	388,434	922,046	8,984	36,211

No special blister rust canker elimination work was performed in the region prior to 1932.

Table 44 - Blister Rust Canker Elimination Work, 1932-1943, InclusiveBy Land Ownership Classes

Ownership Class	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	No. Cankers Removed		Total Man Days
				Branch	Stem	
State and Private Lands	7,985,116	277,722	378,840	893,512	6,232	33,934
Acadia National Park, Me.	60,807	3,276	9,594	28,534	2,752	2,200
Totals	8,045,923	280,998	388,434	922,046	8,984	36,211

Table 45

- WHITE PINE LUMBER PRODUCTION AND ESTIMATED STUMPAGE, LOG AND LUMBER VALUES DURING 1942 IN THE UNITED STATES

(Information derived from sources indicated in footnotes)

Region	State	Eastern White Pine			Western White Pine			Sugar Pine			Eastern, Western and Sugar Pine			Estimated Value of Out on Basis of Stumpage Prices					Estimated Value of Cut on Basis of Log Prices					Estimated Value of Cut on Basis of Lumber Prices at Mill	
		Total Production (M Ft., bm)	% Grand Total	Total Production (M Ft., bm)	% Grand Total	Total Production (M Ft., bm)	% Grand Total	Total Production (M Ft., bm)	% Grand Total	Total Production (M Ft., bm)	% Grand Total	No. Transactions	Quantity (M Ft.)	Ave. Price Per M	Total Value	No. Transactions	Quantity (M Ft.)	Ave. Price Per M	Total Value	Ave. Price Per M	Total Value				
Northeastern	Connecticut	4,850	0.45	-	-	-	-	-	-	4,850	0.27	18	1,130	\$5.02	\$24,347.	(Ave. for N.E. States)	174	24,072	\$17.24	\$33,614.	\$35.74	\$173,339.			
	Maine	256,547	23.69	-	-	-	-	-	-	256,547	14.12	175	61,802	6.53	1,675,252.	174	24,072	16.17	4,148,365.	29.80	7,645,101.				
	Massachusetts	69,241	6.39	-	-	-	-	-	-	69,241	3.81	55	12,262	5.96	412,676.	24	6,294	15.01	1,039,307.	30.06	2,081,334.				
	New Hampshire	277,927	25.67	-	-	-	-	-	-	277,927	15.3	74	15,293	5.26	1,461,896.	76	22,277	13.46	5,130,532.	27.16	7,543,497.				
	New Jersey	358	0.03	-	-	-	-	-	-	358	0.02	(Same as Pa.)	7.59	2,717.	2,717.	(Same as Pa.)	22,277	13.46	7,593.	42.46	15,201.				
	New York	31,172	7.5	-	-	-	-	-	-	31,172	4.47	63	15,575	6.80	551,970.	72	9,920	13.25	1,431,389.	35.96	2,918,945.				
	Pennsylvania	38,713	3.57	-	-	-	-	-	-	38,713	2.13	34	3,410	7.59	293,832.	21	876	21.21	821,103.	36.64	1,413,444.				
Southern Appalachian	Rhode Island	4,376	0.4	-	-	-	-	-	-	4,376	0.24	9	732	7.14	31,245.	1	932	15.93	69,928.	27.54	120,515.				
	Vermont	44,366	4.1	-	-	-	-	-	-	44,366	2.44	48	12,040	6.31	279,949.	49	4,461	13.04	300,363.	30.14	1,337,191.				
	Sub-Total	777,550	71.8	-	-	-	-	-	-	777,550	42.8	-	-	-	4,733,884.	-	-	-	13,532,194.	-	23,253,617.				
	Georgia	4,537	0.42	-	-	-	-	-	-	4,537	0.25	(Same as N.C.)	7.73	35,071.	35,071.	(Same as S.C.)	40	16.00	72,592.	18.05	81,393.				
	Kentucky	2,199	0.2	-	-	-	-	-	-	2,199	0.13	5	205	4.09	8,994.	1	40	3.50	18,692.	37.44	82,331.				
	Maryland	294	0.03	-	-	-	-	-	-	294	0.02	1	90	5.00	1,470.	1	1	25.00	7,350.	27.17	7,988.				
	North Carolina	38,625	3.57	-	-	-	-	-	-	38,625	2.13	27	2,617	7.73	298,571.	6	315	15.22	587,873.	23.85	921,206.				
North Central	South Carolina	826	0.03	-	-	-	-	-	-	826	0.05	(Same as N.C.)	7.73	6,335.	6,335.	1	30	16.00	13,216.	22.80	13,833.				
	Tennessee	17,198	1.59	-	-	-	-	-	-	17,198	0.95	3	115	7.09	121,934.	3	311	17.50	300,965.	31.79	546,724.				
	Virginia	13,374	1.70	-	-	-	-	-	-	13,374	1.02	21	1,503	7.05	129,537.	3	169	23.62	433,994.	26.45	485,992.				
	West Virginia	4,477	0.41	-	-	-	-	-	-	4,477	0.25	6	557	3.43	37,741.	(Same as Va.)	169	23.62	105,747.	24.72	110,671.				
	Sub-Total	86,530	8.0	-	-	-	-	-	-	86,530	4.8	-	-	-	639,703.	-	-	-	1,540,429.	-	2,255,638.				
	Illinois	65	0.01	-	-	-	-	-	-	65	0.005	(Ave. for Central States)	7.22	469.	469.	(Ave. for Central States)	36	16.81	1,093.	35.00	2,275.				
	Indiana	28	0.01	-	-	-	-	-	-	28	0.005	-	-	7.22	202.	2	36	22.92	642.	35.00	930.				
Northwestern	Iowa	253	0.03	-	-	-	-	-	-	253	0.01	17	2,026	7.22	1,827.	(Ave. for Central States)	42	16.81	4,253.	39.58	10,014.				
	Michigan	34,684	3.2	-	-	-	-	-	-	34,684	1.91	18	3,527	10.22	354,470.	42	5,323	29.93	1,038,092.	41.69	1,445,976.				
	Minnesota	129,587	11.97	-	-	-	-	-	-	129,587	7.1	(Ave. for Central States)	5.71	739,942.	17	6,498	24.04	3,115,271.	31.12	4,032,747.					
	Ohio	143	0.01	-	-	-	-	-	-	143	0.01	(Ave. for Central States)	7.22	1,069.	1,069.	(Ave. for Central States)	55	16.81	2,438.	24.52	3,629.				
	Wisconsin	53,806	4.97	-	-	-	-	-	-	53,806	2.96	50	5,020	10.60	570,344.	55	31,453	26.16	1,407,565.	43.25	2,327,110.				
	Sub-Total	218,571	20.2	-	-	-	-	-	-	218,571	12.0	-	-	-	1,668,323.	-	-	-	5,569,404.	-	7,322,731.				
	Idaho	-	-	-	-	-	-	-	-	-	-	49	200,142	7.17	2,305,449.	49	8,097	21.52	6,919,562.	(2)	13,199,253.				
Southwestern	Montana	-	-	-	-	-	-	-	-	18,707	1.0	7	1,361	6.63	124,027.	11	1,500	19.09	357,117.	37.44	700,390.				
	Washington	-	-	-	-	-	-	-	-	53,646	3.0	16	2,402	6.65	356,746.	25	20,843	25.00	1,341,150.	41.05	2,202,163.				
	Sub-Total	-	-	-	-	-	-	-	-	393,894	21.7	-	-	-	2,786,222.	-	-	-	8,617,829.	-	16,101,816.				
	California	-	-	-	-	-	-	-	-	262,787	14.46	54	99,314	4.92	1,292,912.	7	2,849	14.53	3,818,295.	40.58	10,663,896.				
	Oregon	-	-	-	-	-	-	-	-	77,068	4.24	5	151	4.64	6,816.	27	700	22.92	33,669.	(3)	62,300.				
	Sub-Total	-	-	-	-	-	-	-	-	338,386	18.7	-	-	-	477,786.	8	6,936	14.39	1,087,870.	45.43	3,434,463.				
	Sub-Total	-	-	-	-	-	-	-	-	-	-	-	-	-	1,777,514.	-	-	-	4,939,834.	-	14,160,659.				
Grand Totals	% Total	1,082,651	100.0	395,363	100.0	338,386	100.0	338,386	100.0	1,816,400	100.0	-	-	-	\$11,605,646.	-	-	-	\$34,249,690.	-	\$63,599,461.				

(1) - Same as Illinois. (2) - Same as Washington. (3) - Western white pine.

Volume Data and Average Mill Prices

From Bureau of Census bulletin "Production of Lumber, Lath and Shingles, Average Selling Value and Estimated Stocks of Lumber - 1942".

Average Stumpage and Log Prices

From U.S.D.A. Statistical Bulletin No. 79 - "Stumpage and Log Prices For The Calendar Year 1942".

Note

Where average stumpage, log and lumber prices at the mill were not available, the average prices used were those for an adjoining state or for the respective region as in Illinois, Indiana, Iowa, and Ohio where the average prices are those for the Central States region.

ANNUAL REPORT
ON
WHITE PINE BLISTER RUST CONTROL
SOUTHERN APPALACHIAN STATES
1943

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J. Curtis Pail

March 20, 1944

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Sections 3, 4, 5 and 6.

TABLE #1, SHEET #1
SUMMARY OF 1943 RIBES ERADICATION

INITIAL ERADICATION WORK					REERADICATION WORK					TOTALS		
Acreage Worked	Number and Cultivated Ribes Destroyed	8-Hour Man-Days	Acreage Worked	Number and Cultivated Ribes Destroyed	8-Hour Man-Days	Acreage Worked	Number and Cultivated Ribes Destroyed	8-Hour Man-Days	Number Wild and Cult.	Number Wild and Cult.	Supervision	Supervision
415	321	809	2,560	7,090	262	415	321	809	321	321	1,071	1,071
99,960	376	89	95,738	18,225	885	102,520	7,466	120	60,572	60,572	80	80
120	69	33	3,159	44,896	869	96,758	18,225	855	18,225	18,225	855	855
1,020 (1)	69	33	38,568	545,465	3,757	180,285	44,965	902	44,965	44,965	902	902
177,126	14,829	333	88,024	106,078	2,931	90,504	560,294	4,000	560,294	560,294	4,000	4,000
1,936	19,694	253				92,025	125,772	3,118	125,772	125,772	3,118	3,118
4,001												
TOTALS	284,578	1,517	278,049	721,754	8,674	562,627	817,615	1,273	1,273	1,273	10,151	10,151

2,263 man days surveying this blockout
are credited under mapping. See Table
Sheet #1.

TABLE #1, SHEET #2
SUMMARY OF 1943 RIBES ERADICATION

RIBES PER ACRE				MAN-DAYS PER ACRE				NUMBER OF EMPLOYEES			
Initial Eradication	Reeradication	Initial Eradication	Reeradication	Initial Eradication	Reeradication	Initial Eradication	Reeradication	LABORERS	LABORERS	LABORERS	LABORERS
Initial Eradication	Reeradication	Initial Eradication	Reeradication	Initial Eradication	Reeradication	Initial Eradication	Reeradication	LABORERS	LABORERS	LABORERS	LABORERS
0.77	2.77	0.008	0.102	0.77	2.77	0.008	0.102	0.77	2.77	0.008	0.102
0.0037	0.74	0.008	0.74	0.0037	0.74	0.008	0.74	0.0037	0.74	0.008	0.74
504.7	0.19	0.009	0.009	504.7	0.19	0.009	0.009	504.7	0.19	0.009	0.009
	14.23	0.253	0.253		14.23	0.253	0.253		14.23	0.253	0.253
7.66	6.16	0.17	0.04	7.66	6.16	0.17	0.04	7.66	6.16	0.17	0.04
4.92	1.20	0.063	0.033	4.92	1.20	0.063	0.033	4.92	1.20	0.063	0.033
TOTALS	0.34	2.60	0.005(1)	TOTALS	0.34	2.60	0.005(1)	TOTALS	0.34	2.60	0.005(1)

This figure would be .013 if in Tennessee the 2,263 man days surveying were also used here in mapping coverage.

TABLE #2, SHEET #1
SUMMARY OF 1943 RIBES ERADICATION - BY PROGRAMS

REGULAR AND COOPERATIVE*						S. C. S.	
STATE	Acreage Worked	Number Wild and Cult. Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Wild and Cult. Ribes Destroyed	Number 8-Hour Man-Days	Number Wild and Cult. Ribes Destroyed
Del.	415	321	Supv.	-	-	-	-
Ga.	102,520	7,466	1,071	-	-	-	-
Md.	120	60,572	89	-	-	-	-
N. C.	96,202	10,705	566 (1)	550	7,920	299	-
Tenn.	180,285	44,965	902	-	-	-	-
Va.	87,723	515,673	3,060	2,781	44,621	1,030	-
W. Va.	92,025	125,772	3,184	-	-	-	-
TOTALS	559,290	765,474	8,872	3,537	52,141	1,319	-

(1) Days surveying B. O. acreage omitted.

TABLE #3, SHEET #1
SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP - 1943

LAND OWNERSHIP	INITIAL WORK			RIBERADICATION WORK			TOTALS		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Nat. Forests	237,933	12,776	641	161,710	572,514	5,197	390,643	585,290	5,839
O&C Rev. Lands	-	-	-	-	-	-	-	-	-
Other Pub. Domain	-	-	-	-	-	-	-	-	-
National Parks	1,936	14,829	333	1,401	37,759	986	3,337	52,588	1,319
Ind. Reservations	-	-	-	-	-	-	-	-	-
SUBTOTAL FEDERAL	239,869	27,605	974	163,111	610,273	6,183	402,980	637,878	7,157
State & Private	44,709	68,256	503	144,938	111,481	2,491	159,641	179,731	2,100
GRAND TOTAL	284,578	95,861	1,517	278,049	721,754	8,674	562,627	817,615	10,191

*Wild and cultivated ribes.

TABLE #4, SHEET #1
SUMMARY OF ALL OTHER CONTROL WORK FOR 1943

CULTIVATED BLACK CURRANT ERADICATION				NURSERY SANITATION				MAPPING CONTROL AREAS			
No. In- spections Made	No. Loca- tions Found	No. Black Currants Destroyed	No. Currants Man-Days Worked	No. W.P. in Nurs.	No. Will Acres and Cult.	No. 8- Worked Ribes Destr.	No. 8- Days	No. 8- Days	No. 8- Days	No. 8- Days	No. 8- Days
Delaware	-	-	-	-	-	-	-	-	415	Supv.	Supv.
Georgia	-	-	-	-	-	-	-	-	99,800	1,045	1,045
Maryland	-	-	-	-	-	-	-	-	-	-	-
North Carolina	-	-	-	-	-	-	-	-	91,193	808	808
Tennessee	-	-	-	-	-	-	-	-	177,126	1,976	1,976
Virginia	-	-	-	-	-	-	-	-	98,588	2,420	2,420
West Virginia	-	-	-	1	600	651	67	67	129,587	1,207	1,207
TOTALS	-	-	1	1	600	651	67	67	596,709	7,816	7,816

TABLE #4, SHEET #2
SUMMARY OF ALL OTHER CONTROL WORK FOR 1943

TREATMENT OF INFECTED WHITE PINES										CHECKING			
Total Number Pines Examined	Number Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	No. Cankers Removed	Number 8-Hour Man- Days	Acres Checked	Advances 8-Hour Man-Days	Post Acres Checked	Number 8-Hour Man-Days	Regular Acres Checked	Number 8-Hour Man-Days	Number 8-Hour Man-Days	Number 8-Hour Man-Days	Number 8-Hour Man-Days
Del.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ga.	-	-	-	-	-	120,640 (1)	152.0	63	145	Supv.	Supv.	Supv.	Supv.
Md.	-	-	-	-	-	-	-	-	8	9	9	9	9
N. C.	-	-	-	-	-	-	440.9	55	37.1	24	24	24	24
Tenn.	-	-	-	-	-	-	193.0	62	64	69	69	69	69
Va.	957	10	99	6	24	1.5	-	Supv.	285.2	202	202	202	202
W. Va.	50,660	667	914	73	27	78.6	1,541.1	420	408.2	77	77	77	77
TOTALS	51,617	677	1,013	79	51	120,720	2,326	600	947	381	381	381	381

(1) Acres covered by general reconnaissance in advance of survey crews.

TABLE #5. CONT'D #1

SUMMARY OF EXPENDITURES FOR 1943

Recreation of Wilderness Funds									
State	Federal	Emergency Funds				Regular Funds			
		Bureau of Zoology & Plant Quarantine		Department of Interior		Forest Service		National O & C Indian Lands	
		Grand Total	Leadership & Coord. (3101)	Lea Act (3103)	Forest Service	National Parks	Indian Lands	Total Regular Funds	C.P.S. SCS Emergency Funds
Del.	52.60	72.70	125.33	-	52.63	-	-	52.63	-
Pa.	19,505.70	1,800.56	21,306.26	7,318.23	1,412.57	10,774.90	-	19,505.70	-
Id.	914.68	1,074.00	1,888.68	776.58	36.10	-	-	814.68	-
N. C.	17,356.20	5,965.33	23,321.53	7,081.11	5,544.04	3,274.55	425.00	16,324.70	1,011.50
Tenn.	21,085.40	3,130.92	24,216.32	8,389.19	3,841.60	8,854.61	-	21,085.40	-
Va.	45,521.67	2,241.49	47,563.16	11,394.64	1,699.54	26,783.03	883.96	40,761.17	4,560.50
West Va.	32,204.50	4,465.87	36,670.37	9,861.62	4,751.99	17,590.89	-	32,204.50	-
TOTALS	136,320.78	18,750.87	155,071.65	44,821.37	17,340.47	67,277.98	1308.96	130,748.78	5,572.00

TABLE #5, Sheet #2

SUMMARY OF EXPENDITURES FOR 1943

Financial Projects									
State	BLR-1 - Leadership, Coordination and Technical Direction				BLR-3 - Cooperative Blister Rust Control on State and Privately-Owned Lands				BLR-6 BLR-7 : C and C Indian Revested Reser- vation Lands
	Indirect Aid State*	Federal		Total	Direct Aid State*	Federal		Total	
		Regular	Emergency			Regular	Emergency		
Del.	-	-	-	72.70	52.65	-	125.33	-	-
Pa.	1,032.00	7,516.25	-	753.53	1,412.57	-	2,161.13	10,774.90	-
Id.	1,074.00	776.58	-	-	38.10	-	38.10	-	-
N. C.	1,464.50	7,081.11	-	4,500.83	5,544.04	-	10,044.87	3,274.55	1436.50 (1)
Tenn.	725.92	8,389.19	-	2,405.00	3,841.60	-	6,246.60	8,854.61	-
Va.	998.00	11,394.64	-	1,245.49	1,699.54	-	2,945.03	26,783.03	5444.46
West Va.	404.00	9,861.62	-	4,061.67	4,751.33	-	8,813.00	17,590.89	-
TOTALS	5,696.42	44,321.37	-	13,052.45	17,340.47	-	30,392.92	67,277.98	6880.96

*Including all local cooperative funds.

(1) Includes \$425.00 estimate of sum paid by National Park B. Messer in Great Smoky Mts. N. P. Work.

SUMMARY OF ALL RIBES ERADICATION 1918 - 1943 (INCLUSIVE)

INITIAL ERADICATION WORK

REERADICATION WORK

STATE	Gross Acreage Reported		Net Acreage Worked in		Number 8-Hour Man-Days		Gross Acreage Reported		Net Acreage Re-Worked		Number 8-Hour Man-Days		Wild and Cult. Ribes Destroyed		Number 8-Hour Man-Days	
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
Del.	4,682	4,682	4,682	3,998	253	-	-	-	115	-	15	-	-	-	-	-
D. C.	1,875	1,875	1,875	-	(1)	-	-	-	-	-	-	-	-	-	-	-
Pa.	1,061,605	863,075	863,075	5,228,149	25,137	15,571	12,664	2,907	328,993	-	2,582	-	-	-	-	-
Ky.	80,565	80,565	80,565	3,925	837	785	785	-	16	-	(1)	-	-	-	-	-
Md.	176,073	172,632	172,632	3,172,346	12,877	57,956	28,405	9,000	602,641	-	9,344	-	-	-	-	-
N. C.	1,654,098	1,654,098	1,654,098	2,339,118	43,549	1,749,596	146,718	7,179	328,742	-	11,020	-	-	-	-	-
S. C.	29,635	29,635	29,635	7,129	1,245	1,045	1,045	-	358	-	182	-	-	-	-	-
Tenn.	1,261,376	1,261,376	1,261,376	5,661,421	41,648	78,104	78,104	-	328,405	-	4,518	-	-	-	-	-
Va.	702,748	702,748	702,748	5,513,964	61,244	233,513	215,000	18,513	3,100,832	-	33,504	-	-	-	-	-
W. Va.	794,890	794,890	794,890	5,073,045	41,849	229,958	229,958	-	1,060,069	-	12,581	-	-	-	-	-
TOTAL	5,767,547	5,565,576	5,565,576	27,003,095	228,639	2,366,528	712,679	37,599	5,750,171	-	73,746	-	-	-	-	-

(1) Worked by Agent, charged to supervision. (2) Adjustment to agree with Permanent Control Records.

TABLE #1A, SHEET #2

SUMMARY OF ALL RIBES ERADICATION 1918 - 1943 (INCLUSIVE)

INITIAL AND REERADICATION

(1)

PER ACRE

STATE	Gross Initial & Re-Worked Acreage Reported		Net Acreage Worked in		Number 8-Hour Man-Days		Ribes Initial Erad.		Ribes Initial Erad.		Man-Days Initial Erad.	
	a	b	c	d	e	f	g	h	i	j	k	l
Del.	4,682	4,682	4,682	-	-	4,092	-	0.88	-	-	0.06	-
D. C.	1,875	1,875	1,875	-	-	-	-	-	-	-	-	-
Pa.	1,077,176	863,075	863,075	12,664	2,907	245,794	21,29	4.92	21.29	0.17	0.02	0.17
Ky.	81,350	80,565	80,565	785	-	1,837	0.02	0.05	0.02	-	0.01	(2)
Md.	234,029	172,632	172,632	28,405	9,000	7,851	10.40	18.01	10.40	0.16	0.07	0.16
N. C.	3,405,694	1,654,098	1,654,098	1,749,596	7,179	674,511	0.13	1.41	0.13	0.03	0.03	0.03
S. C.	30,580	29,635	29,635	1,045	-	7,437	0.34	0.24	0.34	0.05	0.04	0.05
Tenn.	1,359,480	1,261,376	1,261,376	78,104	-	232,505	4.20	4.49	4.20	0.05	0.03	0.05
Va.	936,261	702,748	702,748	215,000	18,513	60,191	13.28	7.85	13.28	0.14	0.08	0.14
W. Va.	1,024,848	794,890	794,890	229,958	-	22,356	4.00	6.32	4.00	0.06	0.06	0.06
TOTAL	8,184,076	5,565,576	5,565,576	712,679	27,599	1,904,538	4.65	4.65	4.65	0.09	0.09	0.09

Footnotes for Table #1A, Sheet #2, preceding page.

(1) These are based on gross acreage figures.

(2) Worked by Agent, charged to supervision.

(3) Reduction in Georgia to agree with Permanent Control Records.

(4) Cumulative acreage increased 5,474 to agree with Permanent Control Records in North Carolina.

TABLE #2A, SHEET #1
STATUS OF BLISTER RUST CONTROL, 1918 - 1943 (INCLUSIVE)

STATE	Acreage of White Pine in Net Control Area	Acreage of Net Control Area (White pine & Protection Zones)	Acreage of Net Control Area Initially Worked	Acreage of Net Control Area Reworked			Percentage		Acreage in	
				Other Reworkings	1st Rework	Reworkings Worked	Net Control Area	Initially First Rework	Net Control Area Still Needing Initial Protection	Acreage Now on Maintenance Basis
Del.	214	4,682	4,682	-	-	-	100	-	-	4,682
D. C.	25	1,875	1,875	-	-	-	100	-	-	1,875 (1)
Ga.	537,382	863,425	863,076	2,907	12,664	99.9	99.9	1.39	350	457,235
Ky.	62,417	80,565	80,565	-	785	100	100	0.97	-	80,565
Md.	72,971	174,921	172,632	9,000	28,405	98.68	98.68	16.23	2,289	154,589
N. C.	700,985	1,655,253	1,654,006	7,179	146,718	99.98	99.98	9.0	1,155	1,624,279
S. C.	15,137	29,635	29,635	-	1,045	100	100	3.50	-	29,635
Tenn.	731,743	1,312,185	1,261,376	-	78,104	96.3	96.3	5.96	50,809	1,177,126
Va.	306,230	818,571	702,748	18,513	215,000	86.5	86.5	24.7	115,823	473,525
W. Va.	295,000	800,000	794,890	-	229,958	99.5	99.5	28.7	5,110	590,000
TOTALS	2,722,104	5,741,112	5,565,576	57,599	712,679	97.1	97.1	12.2	175,536	4,593,511

(1) This figure is a reduction from the estimate of 1942 to agree with Permanent Control Records.

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1943 (INCLUSIVE)
(Initial and Reeradication)

REGULAR AND COOPERATIVE

REGULAR AND COOPERATIVE				EMERGENCY			
STATE	Acreage Worked	Number		Acreage Worked	W. P. A. and E. R. A.		
		Number & Cultivated	8-Hour		Number & Cultivated	8-Hour	
		Ribes Destroyed	Man-Days		Ribes Destroyed	Man-Days	
Delaware	422	562	12	4,260	3,551	256	
District of Columbia	1,875	-	-	-	-	-	
Georgia	128,445	17,218	1,631	757,543	5,514,671	25,304	
Kentucky	18,210	16	- (1)	1,617	-	- (1)	
Maryland	3,053	222,226	528	83,105	1,773,331	13,292	
North Carolina	158,655	62,770	1,198	2,173,101	2,358,603	46,037	
South Carolina	3,145	12	12	4,050	556	596	
Tennessee	180,285	44,965	902	975,761	5,664,617	41,978	
Virginia	134,269	668,793	3,060	585,572	5,183,682	60,414	
West Virginia	155,356	247,482	4,743	736,082	4,892,741	37,655	
TOTALS	783,715	1,264,044	13,466	5,321,091	25,391,752	225,532	

(1) Agent's work.

TABLE #3A, SHEET #2

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1943 (INCLUSIVE)
(Initial and Reeradication)

STATE	C.P.S., C. C. C. & S. C. S.				P. W. A. or N. R. A.				Total Emergency Program (W.P.A.-C.C.C.-P.W.A.)			
	Acreage Worked	Number & Cultivated Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number & Cultivated Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number & Cultivated Ribes Destroyed	Man-Days	Number 8-Hour Man-Days	Number 8-Hour Man-Days	Number 8-Hour Man-Days
Del.	-	-	-	-	-	-	4,260	3,551	256			
D. C.	-	-	-	-	-	-	-	-	-			
Ga.	15,493	235	51	175,695	25,018	733	948,731	5,539,924	26,088			
Ky.	-	-	-	61,523	3,925	837	63,140	3,925	837			
Md.	20,435	586,051	4,812	127,436	1,193,379	3,589	230,976	3,552,761	21,693			
N. C.	166,755	95,611	3,383	905,183	150,876	3,951	5,245,059	2,605,090	53,371			
S. C.	888	-	21	22,597	6,919	798	27,535	7,475	1,415			
Tenn.	61,094	111,635	1,847	122,340	168,609	1,439	1,159,195	5,944,861	45,264			
Va.	92,020	2,021,046	24,423	124,400	741,275	5,471	801,992	7,946,003	90,308			
W. Va.	87,365	647,157	9,622	46,045	345,734 (1)	2,410	869,492	5,885,632	49,687			
TOTALS	444,050	3,461,735	42,840	1,585,219	2,635,735 (1)	19,228	7,350,360	31,489,222	288,919			

(1) These figures agree with figures of 1941 and earlier years. 1942 figures were 100 too much.

TABLE #4A, SHEET #1
SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP 1918-1943 (INCLUSIVE)

NET CONTROL AREA		INITIAL ERADICATION					
LAND OWNERSHIP	Acreage of White Pine in Net Control Area	Total Acreage (W.p. & Prot.Zones)	Acreage Not Yet Worked Initially	Gross Acreage Reported Initially Worked	Net Acreage Worked in Control Area	Gross No. Wild & Cult. Ribes Destroyed	Gross No. 8-Hour Man Days
National Forests	793,164	1,478,255	129,417	1,452,750	1,348,838	8,650,099	68,728
O & C Revested Lands	-	-	-	-	-	-	-
Other public domain	-	-	-	-	-	-	-
National Parks	73,579	131,510	-	131,510	131,510	1,755,998	15,334
Indian Reservations	22	445	-	445	445	-	1
SUBTOTAL (FEDERAL)	866,765	1,610,210	129,417	1,584,705	1,480,793	10,406,097	84,063
State and Private	1855,339	4,130,902	46,119	4,182,842	4,084,783	16,596,998	144,576
GRAND TOTALS	2722,104	5,741,112	175,536	5,767,547	5,565,576	27,003,095	228,639

TABLE #4A, SHEET #2
SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIPS - 1918 - 1943 (INCLUSIVE)

LAND OWNERSHIP	REERADICATION WORK					TOTALS		
	Gross Acreage Reported	Net Acreage Re-Worked in Control Area	Gross Number Wild & Cultivated	Gross Number 8-Hour Man-Days	Gross Initial and Re-Worked Acreage Reported	Initial		
	Re-Worked	Ist	Others	Ribes Destroyed				
National Forests	419,173	275,684	15,496	2,192,984	23,135	1,871,923	1,348,838	
O & C Revested lands	-	-	-	-	-	-	-	
Other public domain	-	-	-	-	-	-	-	
National parks	29,016	17,819	3,165	855,862	11,577	160,526	131,510	
Indian Reservations	-	-	-	-	-	445	445	
SUBTOTAL(FEDERAL)	448,189	293,503	18,661	3,048,846	34,712	2,032,894	1,480,793	
State & Private	1,918,339	419,176	18,938	2,701,325	39,034	6,101,181	4,084,783	
GRAND TOTALS	2,366,528	712,679	37,599	5,750,171	73,746	8,134,075	5,565,576	

TABLE #4A, SHEET #2 (Continued)

LAND OWNERSHIP	TOTALS (INITIAL & RE-WORK)							
	Net Acreage Initial and Re-Work	Gross Number Wild & Cultivated	Gross Number Ribes Destroyed	Gross Number 8-Hour Man-Days				
	Ist Re-Work	Other Reworkings						
National Forests	275,684	15,496	10,843,083	91,863				
O & C Revested Lands	-	-	-	-				
Other public domain	-	-	-	-				
National parks	17,819	3,165	2,611,860	26,911				
Indian Reservations	-	-	-	1				
SUBTOTAL (FEDERAL)	293,503	18,661	13,454,943	118,775				
State and Private	419,176	18,938	19,298,323	183,610				
GRAND TOTALS	712,679	37,599	32,753,266	302,385				

TABLE #5A, SHEET #1
SUMMARY OF ALL OTHER CONTROL WORK, 1918 - 1943 (INCLUSIVE)

CULTIVATED BLACK CURRANT ERADICATION										NURSERY SANITATION			
STATE	Number Inspections Made	Number Locations Found	Number Black Currants Destroyed	Number 8-Hour Man Days	Number of Sanitation Zones Maintained	Number of Sanitation Zones Abandoned	Number Nurseries Maintained	Number Acres Worked	Number Nurseries Abandoned	Number Wild & Clt. Ribes	Number 8-Hour Man-Days		
Del.	-	-	-	-	2	5	700	1,300	2,000	93	Supv.		
D. C.	-	-	-	-	-	-	-	-	-	-	-		
Ga.	19	19	1,126	20.00	-	1	-	179	179	8	1		
Ky.	-	-	-	-	2	-	200	-	200	24	Supv.		
Md.	25	25	2,211	No data	7	6	4,180	3,032	7,212	12,495	400		
N. C.	2	2	3	0.25	20	4	5,529	576	6,105	2,394	242		
S. C.	-	-	-	-	-	-	-	-	-	-	-		
Tenn.	-	-	-	-	3	-	1,202	-	1,202	14	12		
Va.	24	24	12	0.25	10	-	2,020	-	2,020	136	16		
W. Va.	1	1	-	0.50	2	-	813	-	813	51,984	808		
TOTALS	71	71	3,352	21.00	45	16	14,644	5,087	19,731	47,148	1,479		

TABLE #5A, SHEET #2
SUMMARY OF ALL OTHER CONTROL WORK, 1918 - 1943 (INCLUSIVE)

MAPPING CONTROL AREAS										TREATMENT OF INFECTED WHITE PINES			
STATE	No. Acres Mapped (White Pine and Protection Zone)	Number 8-Hour Man-Days	Total Number Pines Examined	Number Infected Pines Cut Down	No. Infected Pines Which Cankers Removed	Number Cankers Removed	Branch	Stem	Number 8-Hour Man-Days				
Del.	4,682	449	-	-	-	-	-	-	-	-	-		
D. C.	1,875	Supv.	-	-	-	-	-	-	-	-	-		
Ga.	1,064,165	13,227	-	-	-	-	-	-	-	-	-		
Ky.	80,535	-	-	-	-	-	-	-	-	-	-		
Md.	203,191	2,054	139,354	258	5,033	14,074	651	927					
N. C.	1,731,357 (1)	33,189	-	-	-	-	-	-	-	-	-		
S. C.	29,635	4	-	-	-	-	-	-	-	-	-		
Tenn.	1,372,045	37,118	-	-	-	-	-	-	-	-	-		
Va.	908,318	18,651	635,052	5,302	26,860	165,875	4,488	3,113					
West Va.	963,929 (2)	20,067	50,660	667	914	3,624	73	27					
TOTALS	6,359,762	124,759	825,066	6,227	32,807	183,573	5,212	4,067					

(1) Includes 91,193 acres of resurvey in 1943.
(2) Includes 129,587 acres of resurvey in 1943.

TABLE #6A, Sheet #1
SUMMARY OF ALL EXPENDITURES, 1918 - 1943 (INCLUSIVE)

STATE	Federal		STATE		Grand Total		E. P. I. & B.E.P.Q	Forest Service	National Parks	Indian Lands	Total
	Including State WPA Projects)	(All Agencies)	(Including All Coop. Funds)	STATE (State & Federal Funds)	Federal						
STATE	Including State WPA Projects)	(All Agencies)	(Including All Coop. Funds)	STATE (State & Federal Funds)	Federal	E. P. I. & B.E.P.Q	Forest Service	National Parks	Indian Lands	Total	
Del.	4,768.06		949.20	72.70	5,789.96	345.83	-	-	-	345.83	
D. C.	39.96		-	-	39.96	39.96	-	-	-	39.96	
Ga.	153,441.90		20,371.70	5,539.36	179,352.96	18,614.60	10,774.90	-	-	29,389.50	
Ky.	7,810.11		290.00	-	8,100.11	1,570.33	-	-	-	1,570.33	
Md.	123,443.01		14,002.35	340.75	137,786.11	14,987.30	-	-	-	14,987.30	
N.C.	349,802.99		26,816.09	31,640.44	408,259.52	24,546.72	3,343.05	425.00	-	28,314.77	
S.C.	7,811.40		610.00	-	8,421.40	80.00	-	-	-	80.00	
Tenn.	253,721.25		28,574.74	7,679.39	289,975.38	23,204.56	8,854.61	-	-	32,059.17	
Va.	495,459.37		10,472.29	5,248.96	511,180.62	76,363.90	36,577.60	1588.96	-	114,530.46	
W. Va.	342,849.80		7,041.57	19,860.09	369,751.46	30,881.24	18,769.48	-	-	49,650.72	
TOTALS	1739,147.85		109,127.94	70,381.69	1,918,657.48	190,654.44	78,319.64	2013.96	-	2013.96	270,968.04

TABLE #6A, SHEET #2
SUMMARY OF ALL EXPENDITURES 1918 - 1943 (INCLUSIVE)

RECAPITULATION OF EMERGENCY FUNDS

Federal W. F. A.		State		U. S. C. and S. C. S.		CWA, ARA	
STATE Bureau	For.	Dept.	Total	W.P.A.	Forest	P. W. A.	ERA, NYA
	For.	Int.		(All Bureau)	State Camps	Interior	Total C. S. C. Camps &
Del.	4,422.23	-	4,422.23	-	-	-	-
D. C.	-	-	-	-	-	-	-
Ca.	116,312.31	-	116,312.31	-	281.66	281.66	7,343.52
Ky.	-	-	-	-	-	-	6,239.78
Id.	78,842.75	-	78,842.75	-	6,995.75	6,995.75	22,165.91
N.C.	188,978.89	-	188,978.89	91431.17	3,776.35	3271.46	27,307.10
S. C.	1,876.91	-	1,876.91	-	43.04	-	5,811.45
Tenn.	154,773.16	-	154,773.16	46753.74	6,888.91	255.00	12,871.12
Va.	225,760.03	-	225,760.03	60243.98	9,609.25	43899.92	35,583.49
W. Va.	215,563.17	-	215,563.17	33821.04	25,349.57	-	17,665.60

BLISTER RUST CONTROL IN THE SOUTHEAST
APPALACHIAN STATES FOR CALENDAR
YEAR 1943

INTRODUCTION

This report covers all phases of blister rust control in the calendar year 1943, with cumulative statistical data for all years, 1918 to 1943 and recommendations for 1944. The report has been divided into sections which after Section 2 are based upon ownership of lands, as follows:

- Section 1. Omnibus Tables
- Section 2. Introduction and Narrative Statement concerning work in 1943.
- Section 3. Cooperative control on State and Private lands.
- Section 4. National Forests
- Section 5. National Parks
- Section 6. Indian lands

A Section 7 has been added to include miscellaneous subjects.

ORGANIZATION

The regional office has included Roy G. Pierce, Pathologist-in-Charge; J. Curtis Ball, Associate Forester and Assistant Regional Director; H. K. Cooper, Administrative Assistant from January 1 to May 24, and John R. George, Administrative Assistant from June 1 through December 31; two clerk-stenographers, Mrs. Ellen G. Fischer and Miss Jeane A. Nielsen; Edward T. Hooper, Draftsman to August 3, and Raymond E. Spain, Draftsman from August 27 through December 31. Mr. Cooper was furloughed to accept a position in the War Department, while Mr. Hooper was furloughed to transfer to the Maritime Service.

The following Area and State Leaders were in charge during the year. E. E. Yost, Virginia, Maryland, Delaware and District of Columbia; Ralph W. Welch, West Virginia; H. B. Teague, North Carolina; R. D. Tanksley, Tennessee and W. V. Zimmer, Georgia.

CHANGES IN PERSONNEL

In Richmond as noted above, Mr. John R. George succeeded Mr. H. K. Cooper, and Mr. Spain succeeded Mr. Hooper. In the field two new clerks were appointed: Miss Virginia M. Ash in Georgia, and Miss Joyce Cramer in Virginia.

Terminations included Miss Caroline S. Robinson, clerk, and Agent Hobart A. Whitman, both in North Carolina.

The number of appointed personnel has remained the same throughout the year at 17. In addition to this personnel there were six agents and two clerks who worked part of the year under Letter of Authorization or were paid by a State. A plan of reorganization of the work and reclassification of positions and of increasing the appointed personnel was worked out by Mr. Ball before the middle of the year and was approved in Washington by December 31 to take effect January 1, 1944.

WORK PERFORMED IN 1943 (Combining all Ownership Classes)

Surveying and mapping of control areas in the region were carried on over 596,709 acres, using 7,816 man-days of labor. This is in contrast to surveying and mapping 163,227 acres in 1942, using 2,655 man-days of labor.

Ribes eradication was performed on 562,627 acres during the year, 817,615 ribes bushes being removed with 10,191 man-days. This is in contrast to working 197,541 acres in 1942 and securing 906,407 ribes with an expenditure of 9,238 man-days of labor.

Of the total acreage worked in 1943, only 37,076 acres or 6.5% were found to be ribes-bearing, leaving over 525,500 acres of control area or 93.5% as ribes-free. On the ribes-bearing lands the average number of ribes destroyed per acre was 22.1.

71.1 % of the acreage eradicated in 1943 was in National Forests with 28.3% in State and Private lands, and 0.6% in National Parks. Of ribes bushes pulled in 1943, 71.6% were on the National Forests, 22.0% were on State and Private lands, and 6.4% were on National Parks.

Initial eradication accounted for 50.6% of the acreage and 11.7% of the ribes bushes, while rework accounted for 49.4% of the acreage and 88.3% of the bushes.

All of the work on National Forests and on State and private lands was carried on with Regular Funds, the latter supplemented by State Funds, while all of the work on National Parks was carried on with Emergency Funds.

Canker elimination was carried on in the Seneca State Forest in West Virginia for the first time on 137 acres. Canker elimination in the Shenandoah National Park in Virginia which was carried on during the years 1935 to 1940 inclusive was renewed in 1943 on 62 acres. Details for previous work in each year on the park are to be found in my Annual Report for 1941 on page 3. During 1943 in the region, 51,617 white pines were examined on 199 acres, 677 badly infected trees were destroyed and cankers were removed from 1,013 pines, using 51 man-days labor.

Nursery sanitation was carried on only around the U. S. Forest Service nursery at Parsons. A 3-man crew worked the control area of 651 acres. 635 ribes having 1,814 feet of live stem were destroyed. This is the 15th year that the area has been worked, the first eradication starting in 1929. For the last four years the number of ribes bushes found and destroyed has averaged only 0.65 bush per acre each year. A total of 31,191 ribes has been removed in all workings.

Permanent Records. The compilation of survey and eradication data and maps of the same on permanent printed record forms is an essential activity of the field force. The type of maps and records kept is shown in my annual report for 1942, pages 8 to 15 inclusive.

Considerable progress has been made in the permanent control records. In the six States in which we are regularly carrying on work, including, Georgia, Maryland, North Carolina, Tennessee, Virginia and West Virginia we have index maps for counties as follows:

Permanent Records (Continued)

<u>State</u>	<u>Index Maps Finished</u>	<u>AP-14 Records of Survey & Erad.</u>	<u>AP-18 County Summaries</u>
Georgia	4	7	11
Maryland	2	11	0
North Carolina	25	18	19
Tennessee	15	13	8
Virginia	27	26*	0
West Virginia	10	8	4
	83	83	42

*In the Harrisonburg, Virginia Office only.

Additional Index Maps are being made in the Richmond Office as fast as possible. The AP-14 records of pine acreage survey and eradication records are made in the State and Area Offices in the field. Work is constantly going on keeping the current work posted by blocks and grids, and former work copied from temporary record sheets.

Disease Survey. Surveys for the blister rust were carried out in North Carolina, Tennessee, Virginia and West Virginia. No signs of the rust were found in Tennessee, although the same localities were scouted where the rust was located in 1941. In North Carolina rust was again found on leaves of five Ribes rotundifolium at two places in Avery County, North Carolina at elevations of 4,000 and 4,300 feet. In Delaware rust was found again on ribes, the species being yellow flowering currants, and cultivated red currants and gooseberries, at two places in New Castle County.

In Maryland a survey of 12 State plantations showed the rust to have spread considerably to pine either in 1940 or 1941. No new counties were found infected in the State. In Virginia, the rust was found on ribes for the first time in Bedford, Botetourt and Washington Counties. On pine, it was found for the first time in Giles, Nelson and Rockbridge Counties.

While the four southern counties in West Virginia were scouted for the rust by Messrs. Ball and Welch, no rust was found either on pine or ribes. White pines in Greenbrier County were found infected for the first time. This infection, which dated back to 1932, was located in Spice Run on the Monongahela National Forest, close to the Pocahontas County line.

For details on rust conditions see under State and private lands, National Forests and National Parks.

8/26/44

YEAR OF DISCOVERY OF BLISTER RUST ON RIBES & PINE
BY NUMBER OF COUNTIES

State	1911		1931		1932		1933		1934		1935		1936		1937		1938	
	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P
Delaware															1			
Maryland			2	1			1		1	2	1	1	1		3			
No. Carolina																		
Tennessee																		
Virginia	1		2		3		2		2	3	2				1	1	4	
West Va.			2				1		1	1					1		1	
	1		6	1	3		2	2	3	5	4	2	1		6	1	5	
																	Totals	
	1939		1940		1941		1942		1943				Ribes		Pine			
Delaware	1												2					
Maryland	2												10				5	
No. Carolina					4								4					
Tennessee					2								2					
Virginia	1	1	1		6	2	4	3	3	3			29				15	
West Va.	1	4	5	1	4				1				16				7	
	5	5	6	1	16	2	4	3	3	4			63				28	

CUMULATIVE DATA THROUGH 1943 SHOWING NUMBERS OF COUNTIES
WITH INFECTION ACCORDING TO YEAR OF DISCOVERY

Date	Ribes	Pine
1911		1
1931	6	2
1932	9	2
1933	11	4
1934	14	9
1935	18	11
1936	18	12
1937	24	13
1938	29	13
1939	34	18
1940	40	19
1941	56	21
1942	60	24
1943	63	28

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U. S. DEPT. OF AGRICULTURE

8/26/44

YEAR OF DISCOVERY OF BLISTER RUST ON RIBES & PINE
BY NUMBER OF COUNTIES

State	1911		1931		1932		1933		1934		1935		1936		1937		1938	
	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P
Delaware															1			
Maryland			2	1			1		1	2	1	1	1		3			
No. Carolina																		
Tennessee																		
Virginia	1		2		3		2		2	3	2				1	1	4	
West Va.			2				1				1	1			1		1	
	1		6	1	3		2	2	3	5	4	2	1		6	1	5	
																	Totals	
	1939		1940		1941		1942		1943				Ribes		Pine			
Delaware	1													2				
Maryland	2													10				
No. Carolina					4									4				
Tennessee					2									2				
Virginia	1	1	1		6	2	4	3	3	3				29		13		
West Va.	1	4	5	1	4									16		6		
	5	5	6	1	16	2	4	3	3	3				63		27		

CUMULATIVE DATA THROUGH 1943 SHOWING NUMBERS OF COUNTIES
WITH INFECTION ACCORDING TO YEAR OF DISCOVERY

Date	Ribes	Pine
1911		1
1931	6	2
1932	9	2
1933	11	4
1934	14	9
1935	18	11
1936	18	12
1937	21	13
1938	29	13
1939	34	18
1940	40	19
1941	56	21
1942	60	24
1943	63	27

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U. S. M. N.
OF AGRICULTURE

COOPERATORS:

Direct aid was given to cooperative blister rust control work by the States of Delaware, Georgia, North Carolina, Tennessee, Virginia and West Virginia. The value of such state aid in the calendar year 1943 amounted to \$13,052.45. To offset that amount the Federal Government expended \$17,340.47. In addition, the above states and Maryland gave indirect aid valued at \$5,698.42.

ERADICATION:

Ribes eradication was continued where needed, a total of 159,647 acres being covered in seven states of which 44,709 acres were initial work and 114,938 acres were rework. A total of 179,737 ribes were destroyed, and 3,034 man days labor used. Only one area of 120 acres in Maryland was worked, but the ribes population was heavy, 60,572 bushes being removed. Ribes per acre averaged 504.7. This Maryland area belonged to the State and was an extension of the Herrington Manor Plantation area in Garrett County, including some native pine and proposed planting sites down stream from the lake.

In Delaware, H. B. Teague, in August, carried on a survey of a number of recent pine plantations and older growth for ribes and for the blister rust. Some 321 cultivated ribes were destroyed or were found to have died. Five hundred additional ornamental white pines were located. The blister rust was also discovered on cultivated ribes bushes at two places, viz; on *R. aureum*, *R. sativum* and *R. grossularia*.

In Virginia, all work on private land was confined to Augusta County in the heavily infested area where some 6,314 acres were reworked, and 8,784 ribes were destroyed, an average of 1.4 bushes per acre. Considerable acreage remains to be reworked in Augusta and adjacent Rockingham County, as well as in other sections of the State. In West Virginia, work on private lands was confined to two counties, Pendleton and Pocahontas, most of the acreage covered being rework. In initial work, ribes averaged 3.4 per acre, while in rework they averaged but 1.3 per acre. A total of 31,213 acres were worked in 1943, and 59,953 ribes destroyed.

In Tennessee, eradication was carried on in Carter and Johnson Counties, all of the area covered, 3,036 acres, being rework. 45,907 wild bushes were destroyed and 69 cultivated ones. The former averaged 14.5 per acre. In Georgia, a resurvey of 41,001 acres revealed no ribes, while in North Carolina only, 6 132 ribes were found on 77,543 acres covered.

Summarizing the ribes eradication for the region, we find that while a larger acreage was covered in 1943 than in 1942, the bushes pulled in 1943 were only 40% as numerous as in 1942. Data in past three years follows;

Year	Total Acreage Worked	No. Ribes Destroyed	No. 8-Hour Man Days Labor	Average No. of Acres Worked Per Man Day
1943	159,647	179,737	3,034	52
1942	144,173	451,229	5,671	25
1941	429,801	1,459,270	17,665	24

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Cumulative totals for all years 1913 - 1943 inclusive follow for State & Private Lands

Acreage of whitepine in net control area	1,855,339
Acreage not yet worked initially	46,119
Gross acreage reported worked including	
all work	6,101,181
Net acreage worked initially	4,084,783
Number of ribes removed	19,293,325
Average number acres worked per man day	33

CANKER ELIMINATION:

The first canker elimination project in West Virginia was carried on in the Seneca State Forest in Pocahontas County by State Leader R. W. Welch from January 22 to March 19, 1943 with a 3-man crew. At the head of Thorny Creek a heavy infection on young pine was discovered in the fall of 1942, the infection dating back to 1935. The infection extended over 137 acres. A total of 50,860 trees were examined, of which 1,581 or 3% were found infected. Of the 1,581 diseased trees, 73 were treated by tree surgery, removing infected bark from the stems, 667 trees were felled, since they were either dead or seriously infected on trunk, and 841 were treated by removing 3,624 branch cankers. The removal of the infected trees coupled with the eradication of the wild ribes should slow down the spread of the rust on the forest.

Mr. Welch has written Technical Memorandum No. 7 on "A Canker Elimination Project in the Seneca State Forest, West Virginia", going into detail concerning the work. This memo was distributed on May 1, 1943.

The West Virginia canker elimination project was the only one carried on on State lands in 1943. Other work of similar nature was carried on in Maryland from 1936 through 1939, one operation was on private land and four or five others on state-owned lands. Details are to be found in Maryland Annual Reports for those years, and data for all years are summarized in Omnibus Tables, page 1 - 17 of this report.

SURVEY:

This subject was written up in full in the 1942 annual report, pages 41 and 42. Surveys were continued in 1943, and increases in pine on private and State land were found in Delaware, Tennessee and Virginia while there were decreases in pine acreages in Georgia, North Carolina and Tennessee. There was a net decrease in private and State white pine land of 29,611 acres. This decrease is more than offset by an increase in white pine acreage in national forests, national parks and Indian reservations.

A change of ownership from private to Federal was made in West Virginia by the sale of several thousand acres of pine land to the War Department for use of the new Army General Hospital at White Sulphur Springs. After the war this may be sold back to a hotel corporation, hence we have not changed this ownership, believing it to be temporary.

WHITE PINE:

Surveys and estimates indicate the presence in the nine states and a district, in this region of 1,855,339 acres of white pine. While lumbering of this species has been accelerated for past four years, most of the cutting has not been clear and there is a residual stand of smaller unmerchantable pine trees, saplings and seedlings.

Planting of white pine has been increasing in North Carolina under the guidance of TVA, SCS and the State Forester; while approximately 300,000 trees were planted in Virginia this past year. In West Virginia, the State nursery has 429,500 white pines which will be distributed within the next few years.

In Tennessee white pines were planted on five State forests in the spring of 1943 as follows:

Bledsoe County	Bledsoe Forest	61,850 trees
Franklin "	Franklin "	20,000 "
Morgan "	Morgan "	5,000 "
Pickett "	Pickett "	5,000 "
Several West Tennessee counties	Natchez Trace Forest	7,000 "
Total		98,850 trees

In addition, 9,500 white pines from State nurseries were planted by three persons and firms.

INFECTION CONDITIONS:

In Delaware, no infections have been found as yet on pines, and only three ribes bushes at two places were found infected in 1943. In other words, blister rust infections are probably very few in the state. In Maryland, no general survey was made for the rust in 1943, but from 12 state plantations examined in 1943 it would seem that in either 1940 or 1941 there was a widespread infection from ribes to pine. A heavy infection was found on the 1939 planting at the Blocher Place in Garrett County (Area 49G) for which there is no reasonable explanation, since each area was worked for ribes the year it was planted. On account of the absence of state cooperative funds in Maryland no eradication work was done on private land either in 1942 or 1943, and only two areas of state lands have been worked in the past two years. Consequently, pine infections are very likely to have increased greatly in Garrett County, Maryland. Mr. Yost writing in 1942 stated that "Blister rust is generally distributed throughout Garrett County, and is probably present in every pine tree area. The percent of infection in this county ranges up to 62% for the unprotected and up to 1% for the protected areas."

In Virginia, there was an increase in the number of counties in which infections were found. The blister rust was found in 1943 on ribes for the first time in Bedford, Botetourt and Washington Counties. It was found for the first time on white pine in Giles, Nelson and Rockbridge Counties. With these additional counties, the rust has now been found in 29 of the 34 counties in the control area on ribes and 18 counties on pine. The infection in Craig County was isolated and no appreciable damage has been observed to date. The same is true in Rockbridge County; in Nelson County the rust was found near the Nelson-Rockbridge County line in conjunction with control work along the Blue Ridge Parkway. A small stand of white pine covering less than an acre and largely surrounded by fields was found to have become infected about 1934. Well over 50% of the trees on this area are fatally diseased, as well as many young trees which have sprung up in the surrounding fields.

In West Virginia a new pine infection center was found in Pendleton County on private land on Little Fork below the former CCC camp, about a dozen infected white pine being found in April. The first uredinia were observed on ribes on June 2. On July 18, infection on ribes were so heavy that 125 bushes were found infected. By

NEED FOR RUST CONTROL

July 24, State Lister Well examined the Ribes Section in Pocahontas County. It was extremely heavy this year. In the Hill Run section the crews found at least nine out of every ten bushes that were destroyed were infected. Numerous cultivated red currants on Thomas Creek were found infected in July, bearing telia profusely, but ten cultivated gooseberry bushes in the same garden were uninfected. One large flowering currant at Dunmore was rather heavily infected. For the first time blister rust has been found on pine in Greenbrier County at the headwaters of Spice Run. This pine on the Monongahela National Forest was not reached in the earlier eradication work in 1936 and 1937. Over 300 infected trees were found, the infection running up to 100% of the trees in certain sections of the watershed. Spice Run is on the border between Pocahontas and Greenbrier Counties, and the headwaters with infected trees are within a few miles of the northern county lines. No other rust was found in Greenbrier County this year. A rust inspection trip by Messrs. J. C. Ball and R. W. Welch in Raleigh, Mercer and Monroe Counties in southern West Virginia completed August 23 failed to reveal a single infection of pine or ribes.

In Tennessee where rust was located in 1941 no rust was found this year, though formerly infected bushes were again examined. Rust was again located on ribes in North Carolina in two grids in Avery County.

STATUS OF THE PROJECT:

On State and private lands through 1943 there was an estimated 1,855,330 acres of white pine with a control acreage of 4,130,902, of which 4,084,783 acres or 98.88% was the net acreage initially worked. 438,114 acres, or 10.6% of the entire control area, have been worked. There is also an estimated acreage of 46,119 acres which have never been worked initially, lying for the most part in Tennessee and Virginia. Detailed data for work on private and State lands in 1943 and for all years is to be found in Omnibus Table 3, Sheet 4, and Table 4A, Sheets 7 and 8.

Little progress can be made in Maryland in keeping the ribes population down until after the war, according to information received by Mr. Yost from Dr. Jehle, Plant Pathologist of Maryland.

In West Virginia, ribes eradication is keeping abreast or ahead of the progress of the blister rust except on a few small areas. This has been made possible by a biennial appropriation of \$10,000 to the Conservation Commission of West Virginia for blister rust control, which has been offset by Regular Fund allotments from the U. S. Department of Agriculture.

In Virginia, in the heavily infected counties of Rockingham and Highland we are lagging somewhat behind the disease but in Augusta and Bath Counties we are abreast of the rust as far as known. In the other thirty white pine counties we are ahead of the disease according to our latest survey. Progress in these four counties above listed, as well as in other counties will be slow until a larger appropriation is made available for this work by the State. In the fiscal year, 1943, the amount allotted for blister rust control by the Virginia Department of Agriculture was only \$1,700, and in the fiscal year 1944, \$2,500.

In North Carolina, Tennessee, Georgia, South Carolina and Kentucky the survey and eradication program is far in advance of the spread of the rust. This is borne out by the fact that no pine has ever been found diseased in these five states and rust has been found on ribes only in six counties in North Carolina and Tennessee in 1941.

PERMANENT CONTROL RECORDS

The compilation of permanent control records on large regularly printed AP forms 18 x 22 inches in size is being continued. Records are made by State and county and where there is just State and private land within a county, only one set of AP 14's (Survey and Eradication) is made. Where there is Federal as well as State and private ownership, AP 14's are made for each ownership. Complete AP records have been made for two states, Maryland and North Carolina and good progress is being made in Georgia, Tennessee and West Virginia.

FIELD MANUALS

Mr. J. C. Ball prepared a revision in 1943 of the Checking Manual for Blister Rust Control in the Southern Appalachian States, first prepared in 1940.

In 1939, Mr. Ball prepared a Preeradication Survey Manual, Part A - Grid System.
Part B - Tennessee System.

SUMMARY OF RIBES ERADICATION ON STATE AND PRIVATE LANDS - 1943

State & Private Lands	INITIAL WORK				REERADICATION WORK				TOTALS	
	Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-Days	Supv.	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-Days
Delaware	415	321			-	-	-	415	321	Supv.
Georgia	41,001	-		351	-	-	-	41,001	-	351
Maryland	120	60,572		89	-	-	-	120	60,572	89
North Carolina	1,020	-		-	76,523	6,132	275	77,543	6,132	275
Tennessee	-	69		33	3,036	43,906	793	3,036	43,975	826
Virginia	-	-		-	6,314	8,784	248	6,314	8,784	248
West Virginia	2,153	7,294		70	29,065	52,659	1,175	31,218	59,953	1,245
Total	44,709	68,256	543		114,938	111,481	2,491	159,647	179,737	3,034

TABLE #4A, SHEET #7

SUMMARY OF RIBES ERADICATION ON STATE AND PRIVATE LANDS 1918-1943
INCLUSIVE

State & Private Lands	NET CONTROL AREA			INITIAL ERADICATION WORK			
	a	b	c	d	e	f	g
				Gross Acreage Net Acreage Cross No.			
				Total Acreage* Acreage not yet Reported Worked in Wild & Cult 8-Hour			
				(W.P. & Prot. Zones)			
				Initially Worked Cont. Area Ribes Destroyed			
Delaware	214		4,682	-	4,682	3,938	353
District of Columbia	25		1,875	-	1,875	-	(2)
Georgia	263,261		439,939	350	534,256	439,638	1,516,013
Kentucky	47,939		50,000	-	50,000	1,830	1,830
Maryland	72,971		174,921	2,289	176,073	3,172,346	12,071
North Carolina	533,643		1,425,114	331	1,424,883	1,717,908	13,453
Tennessee	432,079		800,388	15,061	785,327	3,934,930	30,103
South Carolina	13,062		25,935	-	25,935	7,091	1,392
Virginia	192,262		536,416	25,406	511,010	2,013,435	28,736
West Virginia	244,877		671,583	2,782	668,801	4,229,449	27,606
Totals	1,855,339		4,150,902	46,119	4,182,842	16,596,996	144,570

Reeducation Work

(1) Agent's work.

PROGRESS REPORT ON WHITE PINE BLISTER RUST CONTROL WORK
ON NATIONAL FOREST LANDS IN THE SOUTHERN APPALACHIAN
BLISTER RUST CONTROL REGION, UNITED STATES FOREST SERVICE
AND BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE COOPERATION

Forest Service Region 7

1943

Foreword

The four national forests in Region 7 which are incorporated within the white pine blister rust control zone in the Southern Appalachians are the George Washington, the Jefferson, the Monongahela and the Cumberland.

Prior to 1933 a small amount of blister rust control work was performed on some of these forests, mainly the George Washington, but most of this early work was general scouting, looking for the rust, and obtaining a rough estimate of white pine conditions. During the period of various emergency work programs, such as C. C. C., N. I. R. A., P. W. A. and W. P. A., white pine blister rust control work expanded considerably with a large territory being covered and many ribes eradicated. This earlier work however did not keep up with the gradual increase of white pine acreage coming in by natural seeding, and it soon became obvious that a more detailed survey was needed if white pine and ribes conditions were to be definitely known. Except on the Monongahela Forest early pine area maps were inadequate with many areas not having any maps at all. In 1939 the grid system of survey was started on the George Washington whereby the territory to be surveyed is divided up into mile square units. Four to eight strips are run through each grid or portion thereof, depending on conditions, with data being taken on white pine and ribes. The completed grid map is then used as the work unit for ribes eradication and other control activities.

It was not long before the survey started showing up large additional acreages of white pine reproduction. Because of the relatively low cost of this survey plus the valuable information obtained it was decided to resurvey all of the Federal lands on the George Washington, Jefferson and Monongahela National Forests. White pine surveys should someday be conducted on the Cumberland Forest in Kentucky as well. Outside of general periodic scouting for rust no control work on the Cumberland Forest has been done since 1934.

Following the general statistical summary of work accomplished are detailed reports prepared by the Blister Rust State Leaders for work performed under the Forest Service program and prior to this program, on national forests located in their respective States.

February 7, 1944

J. Curtis Ball
Associate Forester

General Summary of Ribes Control Work Performed
on National Forests Under the Forest Service Program
During the Calendar Year 1943

Forest	Acres Surveyed		Acres Worked			Total	Total
	White	Control	Crew	Ribes		Ribes	Man
	Pine	Area*		Free	Total	Pulled	Days
Geo. Washington	42,554	93,203	14,869	50,456	65,325	499,084	5,133
Jefferson	17,047	32,063	1,035	31,028	32,063	34,516	1,127
Monongahela	29,084	52,100	6,737	38,091	44,828	38,661	2,140
Total	88,685	177,366	22,641	119,575	142,216	572,261	8,400

*White pine plus protective zone.

Cost of Operation

1943

Forest	Labor	Supervision and Operation	Total
Geo. Washington	\$20,597.23	\$5,273.55	\$25,870.78
Jefferson	4,628.76	2,146.12	6,774.88
Monongahela	9,237.04	2,291.22	11,528.26
Total	\$34,463.03	\$9,710.89	\$44,173.92

Control Work Performed on National Forest Lands
By all Agencies, 1933-1943 Inclusive

Forest	Acres Surveyed		Acres Worked			Ribes Pulled	Man Days	Acres on Maintenance (Approximate)
	Mapped & Estimated		Initial	Newwork	Total			
	White	Control						
Geo. Wash.	91,702	229,646	175,775	150,542	326,317	2,946,094	30,121	140,000
Jefferson	27,344	32,163	35,517	36,026	71,543	1,379,195	12,737	30,000
Monongahela	29,000	80,000	77,672	46,811	124,483	417,119	5,265	40,000
Cumberland	14,478	30,565	30,565	55	30,620	2,104	337	30,000
Total	162,524	412,274	319,529	233,434	552,963	4,744,512	48,460	240,000

*Maintenance means areas naturally ribes free or areas on which the ribes population has been so greatly reduced that no further work will be needed for a number of years.

Introduction

The first blister rust control work performed on the George Washington National Forest was in 1929 in the vicinity of North River on the Dry River Ranger District. The work was expanded under the CCC and WPA programs. During this period a rough survey was made of what then consisted of the entire forest and only the very best stands of white pine were protected. This survey indicated that there were approximately 77,000 acres of white pine with a control area of 180,000 acres on the forest. The surveys up to December 31, 1945, together with an estimate of the unsurveyed portions of the forest, indicate that there are over 175,000 acres of white pine worth protecting with a control area of over 800,000 acres. This acreage includes a small amount of private holdings which are so located that it was necessary to completely or partially protect it in order to save the federal holdings. It has since been found that white pine has reproduced itself extensively over much of the forest area and that this acreage was also increased by land acquisition. A large percentage of the forest area is ribes free. Conditions on the mountain tops are apparently ideal for ribes growth; therefore, much of the area is on land which marks the limits of the ecological range of ribes. This line of demarkation between the ribes-bearing and ribes-free land can seldom be definitely fixed and it changes readily following variations in the forest cover due to lumbering, fire, closing in of the canopy and many other factors. This makes it necessary that accurate mapping be done, followed by frequent post checking. The grid system of mapping was introduced a few years ago whereby the land is surveyed into square mile units which are permanently established on the ground where necessary. A 2 $\frac{1}{2}$ % or 5% survey, depending upon conditions, is made to determine the distribution and concentration of white pine and ribes. These square mile units are referred to as grids.

The disease was first found in 1933 and is believed to have been first established in the vicinity of Reddish Knob about 1924. Mr. J. W. Cullen found it in the vicinity of Rough Run in 1934. The disease appeared to have originated at this place about 1922. It has since been found in varying concentrations over practically the entire white pine producing areas of the forest. It has been brought under control and this control is, we believe, being maintained where the white pine is of sufficient value and the work was begun at an early enough date.

Control Work Prior to the Calendar Year 1943

Up to December 31, 1945, approximately 260,000 acres were covered and 2,360,000 ribes were destroyed. Of this acreage approximately 55,000 acres received more than one working. The survey and initial work was fairly complete on the better pine stands for that part of the forest in West Virginia but probably not over one-third to one-half complete for Virginia. This is especially true when it is considered that a large amount of land was acquired by the Forest Service in Virginia since the time of the old pine survey.

Control Work During 1943

Control work was carried on continuously in Virginia except for most of July when there was a delay in making funds available. The work was begun in West Virginia late in July. As of the end of the year about 75% of the pine in that part of the Dry River District in West Virginia is believed to be surveyed. Not over 50% of that part in Virginia is covered. No resurvey work has been done in the Lee or Warm Springs Districts. About 75% of the Deerfield and 20% of the Pedlar Districts have been surveyed.

Bradication work was carried on in much the same manner as in the past, i. e., by crews of from 3 to 6 men, depending on the concentration of ribes. Some changes were made in the method of survey, which are described briefly as follows: In West Virginia roads as shown on the U. S. G. S. maps are used as the basic control. Where necessary, these roads are surveyed and stations are established to be used in locating grid corners and mapping lines. In Virginia, formerly all sides of the square mile units or grids were surveyed. At the suggestion of Mr. Howard, Supervisor only the east-west lines were run and these were tied into Class A or other Forest Service corners, using the Atlas Sheets 4" = 1 mile as a base. This method was begun late in the year and no definite comparison can now be made but we are confident that a considerable amount of time is being saved and that more accurate maps are being obtained.

The following tabulation gives a resume of the work and costs by ranger districts and by states:

January to December 1943

	Dry River W. Va.	Dry River Va.	Dry River Total	Deerfield District	Total
Survey:					
Control Acres Resurveyed	43,974	17,305	61,279	31,924	93,203
White Pine Acres Resurveyed	27,975	5,981	33,956	8,598	42,554
Acreage Reported Above:					
Over 50 stems per acre	16,309	5,310	21,619	7,832	28,851
Under 50 " " "	11,666	671	12,337	1,366	13,703
Ribes Eradication:					
Acres Worked by Crew	2,039	4,253	6,292	8,577	14,869
Acres Found Ribes Free	13,940	10,966	24,906	25,550	50,456
Total Acres Covered	15,979	15,219	31,198	34,127	65,325
Ribes Eradicated	27,158	68,837	95,995	403,089	499,084

	Dry River W. Va.	Dry River Va.	Dry River Total	Deerfield District	Total
<u>Man Days, Costs:</u>					
Total Man Days Used (All Activities)	1,106	1,451	2,557	2,626	5,183
<u>Total Cost of Control:</u> (All Activities)					
Cost of Labor	\$4,842.73	\$5,615.37	\$10,458.10	\$10,139.13	\$20,597.23
Cost of Supv. & Operation	1,219.90	1,444.15	2,664.05	2,609.50	5,273.55
Total Cost of Project	6,062.63	7,059.52	13,122.15	12,748.63	25,870.78
<u>Checking:</u>					
Acres Checked, Post & Regular	27,612	3,475	31,087	7,497	38,584

Work Plans for the Remainder of the Fiscal Year - 1944

It is believed that the survey will be completed for that part of the Dry River District in West Virginia and possibly that part in Virginia. It is not probable that the reeradication will be completed in this district in either state. The survey will probably be completed in that part of the Deerfield District in Augusta County. Survey and practically all eradication for Highland County is completed. Possibly all or part of this district in Rockbridge County will be surveyed. It is not likely that any survey or ribes eradication will be done in the Pedlar or Warm Springs Districts before June 30, 1944.

Future Work Plans After June 30, 1944

Dry River District

That part in West Virginia can, with a program similar to the present one, be completely resurveyed and the necessary eradication work completed for this time. Probably no further work will be needed for five years or until the fiscal year of 1950. For that part in Virginia, with a program similar to the present one, the survey and all or most of the eradication for this time should be completed. Post checking should then be resumed about the fiscal year 1948.

Deerfield District

Beginning with the fiscal year 1945, the survey will probably be approaching completion on the Deerfield District. A large amount of eradication work will remain but with a program similar to the one for the current fiscal year, all of the survey and eradication for this time could probably be completed by the end of the fiscal year 1945.

Lee District

Probably no work would be begun or essentially needed on the Lee District before the fiscal year 1946. Insofar as is known, the white pine is relatively scarce and ribes are not widely distributed. The information however, on this ranger district is far from complete.

Warm Springs District

Probably a substantial part of the survey on the Warm Springs District can be completed during the fiscal year 1945. No extensive damage from blister rust is known to have occurred on Forest Service holdings in this district but no work has been carried on for a considerable time, therefore, the problem may be more serious than is now believed. The disease was found on pine and ribes several years ago on private holdings in the vicinity of Warm Springs.

Pedlar District

A grid survey was started in the southern end of this district in Amherst County in 1941 but not a very large percentage of the area was covered. The disease was found on pine on both federal and private holdings in the vicinity of Lye River Gap in the course of control work along the Blue Ridge Parkway this year. Probably no extensive damage has occurred to date but the presence of the rust makes it necessary that this work be begun at the earliest practicable date.

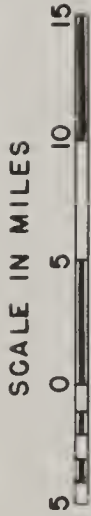
It is not likely that the survey on the forest can be finished before the end of the fiscal year of 1946. Many factors could easily arise that could prevent the completion by this time.

Recommendations

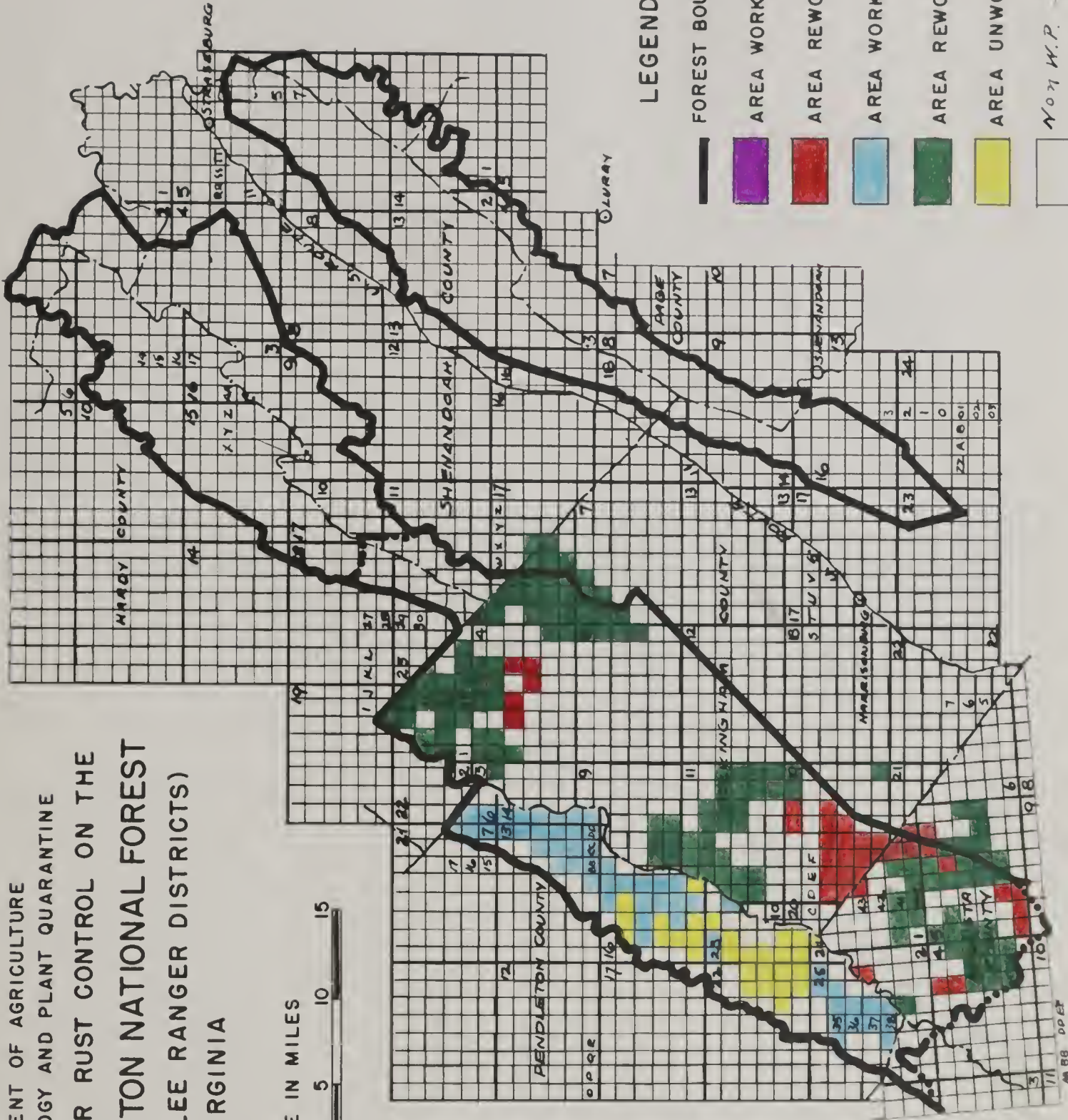
1. A program for the fiscal year 1945 should be set up for that part of the forest in West Virginia of approximately the same size as the present one, which is \$10,950.00. This, we believe, is all that will be necessary until the fiscal year 1950 when post checking should be begun.

2. For that part of the forest in Virginia, an appropriation of approximately \$20,000.00 per year for the fiscal years of 1945 and 1946 will very likely be necessary. Developments in the meantime will determine the needs thereafter. Considering the present labor situation, it is not likely that any greater fund could be efficiently expended. It is believed desirable that the survey be completed as quickly as possible, which would give us a basis for more efficient use of man power for eradication when and if abundant labor is available during the post war period. It is believed that if these recommendations can be carried out that no extensive damage from the blister rust will occur. However, should the weather conditions be extremely favorable for the development of the rust a large amount of damage could occur, particularly in some parts of the Pedlar and Warm Springs Districts.

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
GEORGE WASHINGTON NATIONAL FOREST
(DRY RIVER AND LEE RANGER DISTRICTS)
VIRGINIA



NOTE: GRID NUMBERS
SHOWN ON COUNTY
INDEX MAPS



LEGEND



MADE BY - JUNE 1943

PROGRESS REPORT OF WHITE PINE BLISTER RUST CONTROL OF THE
JEFFERSON NATIONAL FOREST - WILLOWDALE YEAR 1943

Introduction

Some white pine blister rust control work was carried on on what now comprises the Jefferson National Forest from about 1933 to 1937. The work was almost entirely by C. C. C., W. P. A. or other emergency agencies. The disease was found on ribes in most of the counties covering the eastern and northern parts of the forest in 1941. The first rust was found on pines in the Glenwood Ranger District near Longdale Furnace in 1942. No extensive damage is known to have occurred but likewise no intensive scouting has been carried on over any large part of the forest.

Control Work Prior to Calendar Year 1943

During the above-mentioned period of work the survey indicated that there were about 10,000 acres of white pine and a control area of some 40,000 acres on the forest. Eradication work was carried on where necessary over most of this acreage and about 1,250,000 ribes bushes were destroyed. No estimate can be given of the acreage of white pine on the entire forest at the present time since a detailed survey has so far covered only a relatively small portion of it. It is known that this figure is much too low since over 15,000 acres of white pine were found on the resurvey on the Glenwood District alone.

Control Work During the Calendar Year 1943

A transfer of funds from other regions made it possible to begin work using Forest Service funds on March 15, 1943. The work was started in the west end of the Glenwood Ranger District where the survey and eradication was completed and then operations were carried on in the east end of this district. An allotment of \$8,925.00 was made for the fiscal year ending June 30, 1944, which made it possible to complete survey, and where necessary and feasible, ribes eradication in the Glenwood District and to begin work in the New Castle District. The following tabulation gives a resume of the work and costs by ranger districts:

	1943	Glenwood Dist.	New Castle Dist	Total
Survey:				
Control Acres Resurveyed	29,503	2,560	32,063	
Acres White Pine Surveyed	15,367	1,680	17,047	
Ribes Eradication:				
Acres Worked by Crew	1,035	-	1,035	
Acres Found Ribes Free	28,468	2,560	31,028	
Total Acres Covered	29,503	2,560	32,063	
Ribes Eradicated	34,516	-	34,516	
Total Man Days Used (All Activities)	1,085	42	1,127	
Total Cost of Control:				
Cost of Labor	\$4,643.76	\$185.00	\$4,828.76	
Cost of Supervision and Operations	1,872.12	274.00	2,146.12	
Total Cost of Project	6,515.88	459.00	6,974.88	
Acres Checked (Post and Regular)	765	-	765	

A few wild ribes were found in the vicinity of Longdale Mine and along what is locally known as the Mountain Road in the Glenwood District in Allegheny County. A few infected white pine trees were found but no extensive damage had occurred. Excellent white pine, particularly reproduction under hardwoods, was found over a large portion of the federal holdings in this end of the district. In the east end of the Glenwood District excellent white pine of all sizes was found in the valleys and covering the lower ridges. Wild ribes were found within infecting range of white pine at Petites Gap, Parkers Gap and a few places on Big Hill Ridge. Heavy concentrations of wild ribes were found along the western boundaries of Bedford County but no appreciable amounts of white pine were found at these higher elevations. Heavy concentrations were found along Falling Water Creek near Wilkinson Gap. Some white pine was found in this same area but was not protected since it was of such poor quality that it would not justify the cost of ribes eradication.

The work in the New Castle District was confined to federal holdings in Botetourt County west of Gala. So far, no wild ribes have been found in this locality.

Work Plan for Fiscal Year 1944

As of January 1, 1944, work was continuing with headquarters at Longdale Furnace. It is planned to complete survey sometime in February in the northeastern end of the New Castle District and then move the center of operations to New Castle. Survey work will continue throughout the winter and spring unless a sufficiently large amount of eradication work is found necessary to warrant discontinuing of the survey work for this purpose. By June 30 a survey and possibly eradication work should be completed over a substantial portion of the New Castle District.

Future Work Plans

Beginning with the fiscal year 1945 it is estimated that approximately \$8,000.00 to \$10,000.00 per year could be effectively used in this work for at least three more years. A detailed work plan for the fiscal year 1945 will be submitted later. It will in all probability provide for continuing work in the New Castle District and beginning in the Wythe Ranger District. The administrative set-up of the Bureau was recently changed which may make it possible to begin work during the fiscal year 1945 in the southern sections of the Holston District, beginning in Washington and Grayson Counties. It is difficult to estimate when a survey could be completed on the forest since at the present rate the survey may not be completed before land acquisition is resumed by the Forest Service. In all probability a small program of work will be necessary in order to suppress and maintain ribes population to a sufficiently low point and take care of control work on newly acquired lands for several years to come.

Recommendations

The recommendations made in the report for the fiscal year 1943, submitted July 15, 1943, remain unchanged.

Status Map

The following map shows the status and location of the work performed on the New Castle and Glenwood Ranger Districts. All of the current work is regarded as area reworked since theoretically the entire forest was covered some years ago. It is impractical in most cases to determine accurately the extent of the previous work. Those parts of the map left uncolored represent, on the Glenwood District, areas in which no white pine is found on federal holdings. In the Western part of the Glenwood District, extensive stands of white pine are found but at the present time all are privately owned. In the New Castle District, the uncolored portions represent largely "status unknown."

Henry E. Yost, Asst. Pathologist
January 18, 1944

A horizontal scale bar labeled "SCALE IN MILES" with markings at 0, 5, 10, and 15. The bar is divided into segments by vertical lines, with the 0-5 segment further subdivided into four equal parts.

PURCHASE UNIT BOUNDARY

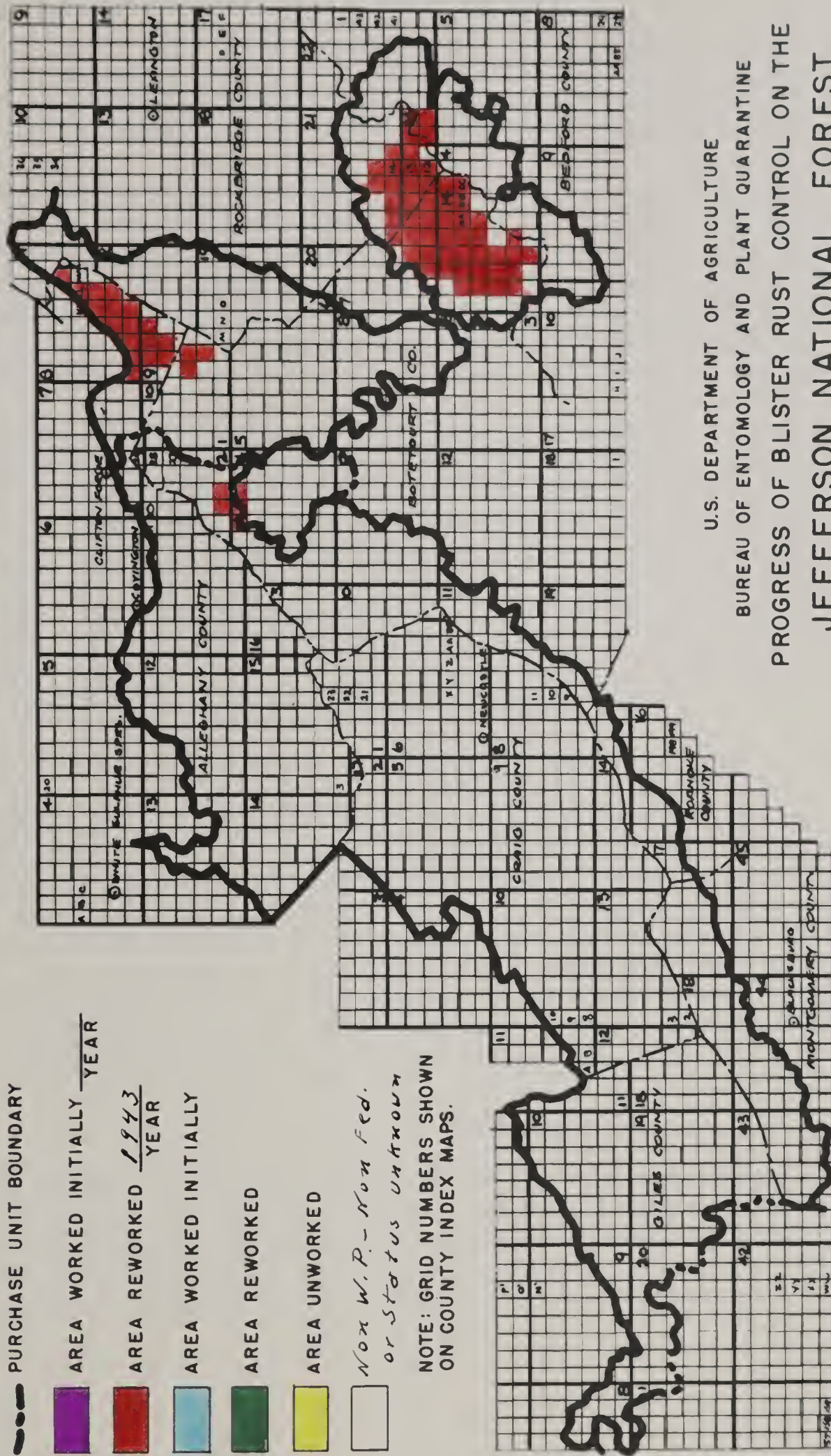
AREA REWORKED 1943
YEAR

AREA REWORKED

Non W.P. - Non Fed.
or Status unknown

NOTE: GRID NUMBERS SHOWN
ON COUNTY INDEX MAPS.

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
JEFFERSON NATIONAL FOREST
(NEWCASTLE AND GLENWOOD RANGER DISTRICTS)
VIRGINIA



Blister Rust Control work was first begun in the Monongahela National Forest in 1936 and by the end of 1938, initial protection had been given to practically all of the white pine stands which were at that time considered worthy of protection from the disease. The program was carried out by utilizing the labor afforded under the CCC and the WPA emergency relief agencies. Supervision and general direction of the work was provided by the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture.

Important stands of native white pine were found growing in two of the five Ranger Districts, those districts being (1) the White Sulphur, from central Pocahontas County south to the southernmost limits of the Forest in Greenbrier County and (2) the Greenbrier, extending north from central Pocahontas County. Native white pine does not occur in the Gauley Ranger District, and, in so far as is known, very little is to be found in the Potomac District. A few stands of some importance are found in the Cheat District, in Tucker County.

In all, 27,250 acres of white pine averaging 50 stems per acre or more were protected from blister rust from 1936 to 1938 on the Monongahela National Forest. In order to protect this pine acreage, it was necessary to examine and remove ribes, where found, within the pine acreage and within a protective strip of 900 feet surrounding the pine stands. The total control acreage worked, composed of the pine acreage plus the protective zone acreage amounted to 75,694 acres. Upon this acreage a total of 375,834 ribes were destroyed at an expenditure of 3,757 man days of labor. After 1938, no additional work was deemed necessary to hold the disease under control until 1941 and 1942, when a small beginning was made on second eradication.

THE 1943 RERWORK PROGRAM

Beginning in February, 1943, and continuing through the remainder of the calendar year, a three purpose program of blister rust control work was conducted in the Monongahela National Forest, with funds provided by the U. S. Forest Service. The program consisted of (1) Resurveying, to determine any change of status in white pine growth, (2) Post checking, to determine the need of reworking those ribes areas where original ribes growth was found and (3) Ribes Eradication, destroying those ribes bushes which threaten damage to the pine stands. This report continues with a description of the three phases of the program as carried out during the year.

RESURVEY

This phase of blister rust control work is considered a necessary part of the control program, since after periods of several years have elapsed between workings, there is always a strong likelihood that pine conditions will undergo considerable change. For example, a stand of white pine that had been considered of sufficient value to merit blister rust control operations

In previous years may have been changes such as reduction of the stand due to cutting or destruction by burning, and it may be found that after a resurvey has been conducted, the stand of pine in question has suffered decrease in value to the extent that further efforts to control blister rust would be uneconomical. Since the resurvey operation is much cheaper than actual destruction of the ribes bushes, a comprehensive resurvey is often a means of conserving both time and money, since it gathers information which serves as the basis for determining whether or not control operations are practical.

In the same way, resurveys, which are nothing more than a reexamination of pine stands by a percentage sampling method, often reveals that pine has increased in either quality, quantity or both. Often white pine spreads its reproduction into outlying areas that were not included in previous blister rust control operations and the results of the resurvey may indicate the necessity of extending control practices into new areas in order that the reproduction may not be wiped out by blister rust, which is extremely deadly to young trees.

During the 1943 calendar year, resurveys were conducted over a total of 52,100 acres of land on the Monongahela National Forest proper and on intermingled private land. This phase of the blister rust control program was accomplished with 438 man days of labor. Thus, an average of 119 acres were resurveyed per man day, the average cost per acre being approximately 3.8 cents. The results of the resurvey fully justified the expenditure since it plainly revealed (1) that white pine acreage is unquestionably on the increase in many parts of the forest, and (2) that in a few cases white pine has decreased in value to the extent that further control activities are no longer necessary.

The increase in white pine acreage in the forest is plainly evident when acreage figures for the initial working in 1936-1938 is compared with figures obtained by the 1943 resurvey. Resurveys were conducted over all or parts of 154 square mile grids in Pocahontas, Tucker and Greenbrier Counties. In the 1936-1938 working, protection was given to a total of 18,489 acres of native white pine on these grids by working a total of 45,120 acres of control area (pine plus 900 foot protective zone). Of the pine acreage, 11,576 was on the forest proper and 6,913 was on nearby, closely intermingled, private land.

The 1943 resurvey indicates that these grids now bear a total of 29,004 acres of native white pine worthy of protection from blister rust, a net increase in pine acreage of 58% in about six years. Although it is conceded that an improved method of conducting surveys has contributed somewhat to the increase in pine acreage figures, it is undoubtedly true that reproduction is spreading out and making yearly gains. Reproductive gains can be largely attributed to successful fire suppression in the white pine belt of the forest. Of the total resurveyed pine acreage, 19,210 acres, or 67% was on the forest proper and the remaining 9,874 acres, or 33% was on closely intermingled private land. Control area acreage increased to 52,100 acres, an increase of 16%.

POST CHECK

This form of sample checking is used when it is desirable to examine control acreage after a lapse of a few years to determine the amount of new ribes growth which has developed after initial eradication or previous rework has been effected. From the results obtained from the post check it is possible to determine whether new ribes growth has developed to the extent that it has become necessary to make a recoverage of the area with an eradication crew, or whether the acreage in question is ribes free or has ribes in such small numbers that eradication measures can safely be delayed until a later date. In some instances during the past years, the resurvey operation, which has been described elsewhere in this report, has provided sufficient data to allow elimination of the post check altogether.

A total of 21,260 acres of control area was examined by post check during the year. This examination was accomplished with 128 man days of labor, an average coverage of 166 acres per man day. The average cost of the post check operation was slightly less than three cents per acre.

RIBES ERADICATION

Eradication of ribes was begun in mid April and continued through the remainder of the growing season, terminating in early October. 17,584 acres of native pine and 39 acres of planted pine were protected within the property boundaries of the forest, plus an additional 7,279 acres of native pine on closely intermingled private land. The grand total of native and planted pine put under protection from blister rust was 24,902 acres. This work was performed on 128 square mile grids, 73 of which bore ribes and 55 of which were ribes free. The total control area acreage involved was 44,828, but 38,091 acres of this amount was ribes free acreage and only 6,737 acres was ribes bearing. Thus, only 15% of the total control area acreage required actual ribes eradication, while 85% was blocked out and dispensed with when examined by post check or resurvey crews.

Eradication crews destroyed a total of 38,628 wild ribes and 53 cultivated ribes bushes on the 6,737 acres of ribes bearing land at an expenditure of 1,468 man days of labor. Coverage per man day averaged 4.7 acres. This work was accomplished in Pocahontas and Tucker Counties.

Definite comparison figures are available in Pocahontas County which clearly demonstrate a sharp reduction in numbers of ribes destroyed in the six to seven year period which elapsed between the first and second workings. When the 125 grids involved in that county were initially worked in 1936 and 1937, a total of 38,267 acres of control area yielded 112,225 ribes. In 1943, an increased control acreage (44,562 acres) yielded only 32,695 ribes.

Of the 128 grids upon which work was performed in 1943, 99 had either no ribes, or ribes in such few numbers that damage from blister rust within the next ten years should be negligible. Also, certain sections of the remaining 29 grids were ribes free.

It is recommended that the ribes free acreage and the acreage which had a small number of scattered ribes be reexamined in approximately 10 years to determine the need of further blister rust control operations at that time. This acreage amounts to 38,091 blocked out as ribes free and 3,229 with only a small number of bushes.

The remaining 3,508 acres of control area worked yielded a total of 33,490 ribes. Thus, 8% of all control acreage worked yielded 86% of the total number of ribes destroyed. It is recommended that this control acreage be post checked at the end of a five year period to determine the need of a rework program.

INFECTION

Although blister rust infections have become scattered throughout the forest, damage has been held to a minimum. There is every reason to believe, however, that infections would have been severe in several sections of the forest if initial eradication of ribes had not been performed. No better proof can be had in substantiating this statement than the facts presented in the case of the one infection center within the forest which might be described as severe. In northern Greenbrier County, on Spice Run, a considerable stand of white pine was left unprotected from blister rust, due, it is believed, to the inaccessibility of the pine stand to our eradication crews at the time initial work was being performed in that county in 1937 and 1938. In November, 1943, survey crews examined the unprotected stand to evaluate the pine, to determine the need of ribes eradication and to determine the presence or absence of infection. The results of the survey indicate this section supports a very good stand of white pine, that ribes are present in considerable numbers along the main streams and smaller tributaries, and that pine infection has become firmly established where ribes and pine are growing in association. Many small trees have already been destroyed and many others attacked, but not yet dead from the effects of the disease. The preliminary examination revealed some 300 infected trees, and it is very probable that many more infections will appear upon close examination.

Had ribes been permitted to grow unmolested over the entire forest, as they were in this small section, much damage would have been inflicted to the white pine stands. It is not yet too late to save a good portion of this one stand, and plans have been made to avert further damage by removing the ribes during the coming spring and summer.

White pines infected with blister rust were observed in 25 out of 154 square mile grids. In Pocahontas County infections were discovered on Back Draft, Cooper Run, Deer Creek and Moore Run in the Greenbrier Ranger District, and on the following watersheds in the White Sulphur Ranger District: Jakes Run, Sugar Camp Run, Bird Run, Moore Run, Shumate Hollow, Newman Hollow, Eric Hollow, Browns Creek, North Fork of Anthony Creek, Laurel Creek and Spice Run. In Tucker County, infections were observed on Horseshoe Run.



View from Parsons Nursery of the southwest slope of Turkey Knob, which lies in the control area. 11,721 wild ribes have been destroyed on the north and south slopes of this knob from 1929 to 1943 inclusive. (In 1943, 362 bushes).

Photo by Forest Service.

REPORT OF THE STATE LEADER

A total of 635 ribes were destroyed over the 731 acres of control area surrounding the U. S. Forest Service Nursery at Parsons, West Virginia in May and June, 1943. The work was accomplished by a three man crew. A total of 536 man hours was expended in completing the Nursery Sanitation project at a total cost of \$320.69. The 635 ribes bushes destroyed had a total of 1,814 feet of livestem. A detailed report of this project was prepared earlier in the year and copies are on file at the State Blister Rust Control Office, the Regional Office at Richmond, Virginia, and the Forest Supervisor's Office at Elkins, West Virginia.

PLANS FOR CONTINUANCE OF WORK

A large majority of the work in Pocahontas County has been finished as of this date, and the remainder of the white pine to be protected lies principally in Greenbrier County, although a lesser amount is in the Cheat-Ranger District in Tucker County. During the remainder of the winter months between January 1, 1944 and the end of the current fiscal year, plans have been made to complete resurveys of the most, if not all, of the remainder of the pine in the forest. During May and June, all efforts will be concentrated on ribes eradication. It seems unlikely, however, that all needed eradication work can be completed in the forest by the end of this fiscal year.

As already pointed out under the heading "Ribes Eradication", large sections of our control areas are now on a maintenance basis. If work continues throughout the 1944 calendar year, there is good reason to believe that the second working can be completed, and that further expenditure of funds will not be needed within the following five years, except, perhaps for Nursery Sanitation Work.

Ralph W. Welch, State Leader
Blister Rust Control,
West Virginia
December 30, 1943

There follows a statistical analysis of the work performed in 1943 and a status map indicating in which sections the work was performed.

REPORT OF THE MONONGAHELA NATIONAL FOREST, 1943 YEAR

SURVEY STATISTICS

Acrea White Pine Surveyed:

Within Monongahela National Forest - White Sulphur District	17,943
Greenbrier District	1,213
Cheat District	54
Total	19,210

On closely intermingled private land	9,874
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Grand Total, Pine Acreage Surveyed	29,084
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Breakdown of Pine Acreage By Trees Per Acre:

50 or more white pines per acre, Monongahela - White Sulphur	9,054
Greenbrier	729
Cheat	54
Total	9,837

Intermingled Private Land	6,364
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Total, Both Ownerships	16,201
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Under 50 trees per acre, Monongahela - White Sulphur	8,889
Greenbrier	484
Cheat	0
Total	9,373

Intermingled Private Land	3,510
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Total, Both Ownerships	12,883
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Acreage Control Area Surveyed (Pine Acreage Plus Protective Zone):

White Sulphur District, Federal and Private Ownerships	48,081
Greenbrier District	3,753
Cheat District	266

Total Control Area Acreage Surveyed	52,100
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Man Days Utilized in Performing Above Survey	1438
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REMARKS:

All survey work performed during the year was classed as "resurvey", since the territory was the same as that covered by the 1936-1938 initial survey, the only exception being that pine areas were extended to include additional acreage in those cases where pine had increased. Where pine acreage increased, it was very often necessary to also extend and enlarge the protective zone, thus causing an increase in control area acreage. In 1936-1938, a total of 18,439 acres of white pine was surveyed, as against an extended pine acreage of 29,084 acres in 1943 over the same territory. Likewise, the control acreage surveyed increased from 45,120 in 1936-1938 to 52,100 in 1943.

RIBES ERADICATION

Acres White Pine Protected:

Within Monongahela National Forest - White Sulphur District	14,356
Greenbrier District	1,213
Cheat District	94
Total	15,663

On Closely Intermingled Private Land 7,279

Grand total, Pine Protected 21,942

Acres Control Area Worked:

(Control Acreage Not Broken Down by Ownership)

By Eradication Crew (Ribes Bearing Lands)

In White Sulphur District	5,218
In Greenbrier District	1,253
In Cheat District	266
Total	6,737

By Post Check or Resurvey (Ribes Free Lands)

In White Sulphur District	35,591
In Greenbrier District	2,500
In Cheat District	0
Total	38,091

Grand Total, Control Acreage Worked 44,828

Number of Ribes Destroyed:

In White Sulphur District	28,943
In Greenbrier District	3,752
In Cheat District	5,966
Total Ribes Destroyed	38,661

Man Days Expended:

By Eradication Crew

(To clear ribes from ribes bearing lands) 1,468

By Post Check Crew

(To delimit ribes bearing acreage from ribes free acreage
and determine extent of ribes eradication work to do) 126

Total Man Days 1,594

SUMMARY OF MAN DAYS - COSTS

Man Days Expended:

Ribes Eradication (Including Nursery Sanitation,	1,535
Resurvey	438
Post Check	128
Regular Check	26
Miscellaneous	13
Total All Activities	2,140

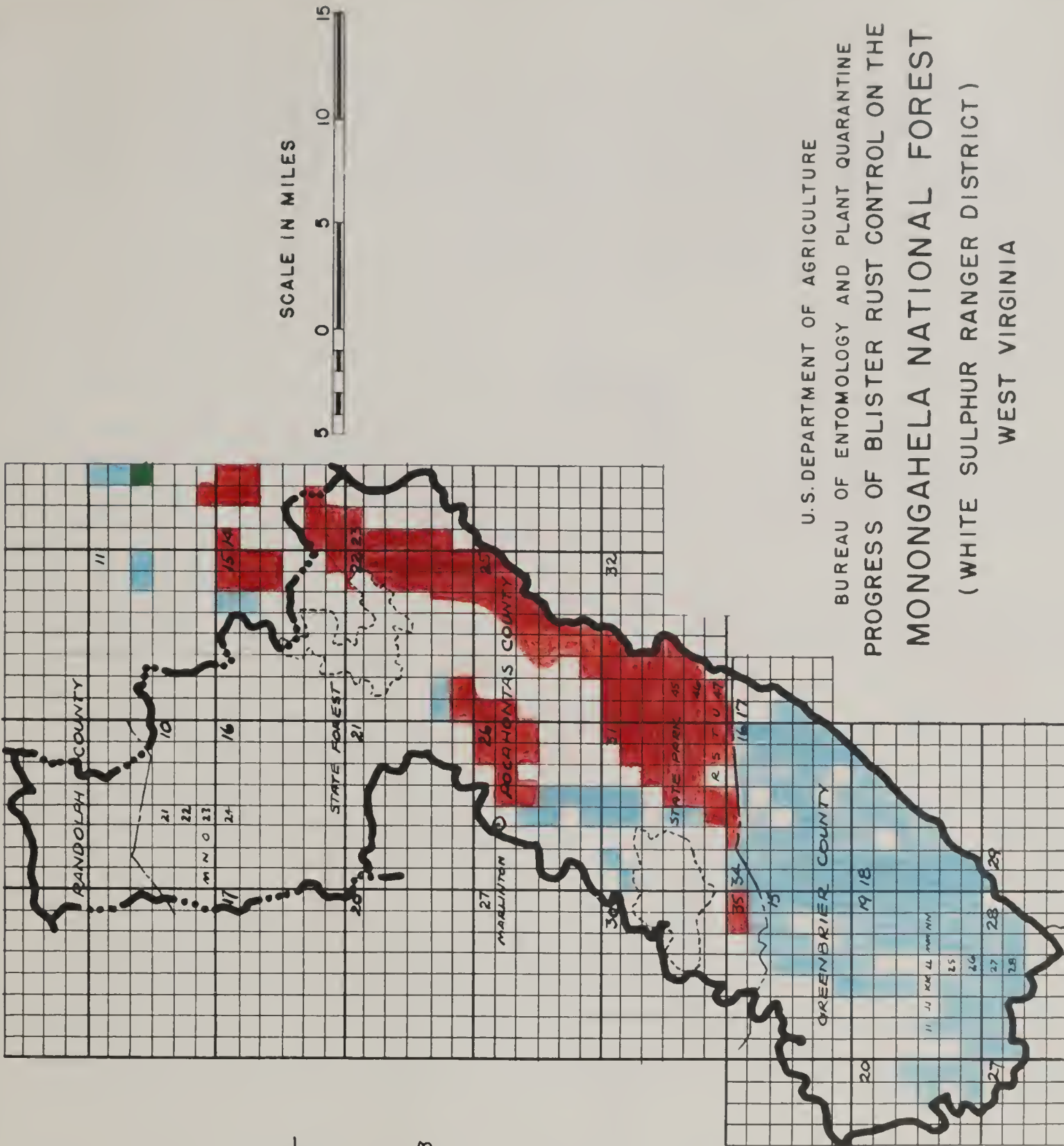
Costs

Labor	\$9,237.04
Supervision and Operation	2,291.22
Total All Activities	\$11,528.26

LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY YEAR
- AREA REWORKED 1943 YEAR
- AREA WORKED INITIALLY PRIOR TO 1943
- AREA REWORKED
- AREA UNWORKED
- Not W.P. - Not Fed. or Status unknown

NOTE: GRID NUMBERS SHOWN ON COUNTY INDEX MAPS.



U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
MONONGAHELA NATIONAL FOREST
(WHITE SULPHUR RANGER DISTRICT)
WEST VIRGINIA

PROGRESS REPORT ON WHITE PINE BLISTER RUST CONTROL WORK
ON NATIONAL FOREST LANDS IN THE SOUTHERN APPALACHIAN
BLISTER RUST CONTROL REGION. UNITED STATES FOREST SERVICE
AND BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE COOPERATING

Forest Service Region 8

1943

Foreword

Since the beginning of the Forest Service White Pine Blister Rust Control project during the 1943 fiscal year and its continuation through the first half of the 1944 fiscal year a good deal of work has been accomplished in spite of labor shortages and travel restrictions.

At the end of the 1943 calendar year we find that about one-third of the contemplated survey work on the Chattahoochee Forest has been completed, one-half on the Cherokee Forest and practically all on the Pisgah Forest.

Post checks on the Chattahoochee and Pisgah National Forests revealed a very small ribes comeback on old eradication areas and very few man days were required to correct these areas. All work on the Cherokee Forest so far has been initial coverage. Excellent white pine was found in certain sections on the Cherokee survey but where wild ribes were encountered the white pine was so scarce or scattered that no ribes eradication work was justified.

On the completion of the surveys on the Chattahoochee and Cherokee Forests there will be only a small amount of work to be carried on in order to maintain those white pine areas which are classed as ribes-bearing. This is now true on the Pisgah Forest where except for a few isolated areas all survey and ribes rework has been completed. To carry on needed maintenance work only a small allotment of funds will be needed to conduct post checks and necessary ribes eradication.

No control work of any kind has been carried on in the Nantahala and Hunter National Forests for a number of years. Although these two forests were found to be free, or practically free of wild ribes in the white pine growing sections at the time of the original survey there is a possibility that white pine may now have spread through natural seeding, to the extent that some resurvey work would be justified. It would probably take less than one year to conduct resurveys, post checking and wild and cultivated ribes eradication on these two forests.

Following the general summary of work accomplished are detailed reports prepared by the Blister Rust State Leaders for work performed under the Forest Service program on national Forests located in their respective states.

February 5, 1944.

J. Curtis Ball
Associate Forester

General Summary of Data for All United States Forests
on National Forests Under the Forest Service Program
During the Calendar Year 1943

Forest	Acres Surveyed		Acres Worked			Total	Total
	White Pine	Control Area*	Crew	Ribes Free	Total	Ribes Pulled	8-Hour Man Days
Chattahoochee	53,963	58,799	219	61,300	61,519	7,466	1,840
Pisgah	14,008	18,438	410	18,249	18,659	4,573	641
Cherokee	96,139	177,126	(1)	177,126	177,126	(1)	1,976
Total	164,110	254,363	629	256,675	257,304	12,039	4,457

*includes white pine and protective zone

(1) 123 acres worked and 990 ribes pulled on F. S. lands by regular cooperative crew. No Forest Service funds used.

Cost of Operation

Forest	Labor	Supervision and Operation	Total
Chattahoochee	\$7,501.17	\$3,273.73	\$10,774.90
Pisgah	2,721.80	552.75	3,274.55
Cherokee	5,496.21	3,358.40	8,854.61
Total	\$15,719.18	\$7,184.88	\$22,904.06

Control Work Performed on National Forest Lands
By All Agencies - 1933 - 1943 Inclusive

Forest	Surveyed, Mapped & Est. Acreage		Acres Worked		Ribes	Man	Acres on Mainte-	
	White	Control	Initial	Re-work	Pulled	Days	nance (Approx.)*	
Chart	269,125	123,137	208,065	10,045	218,110	3,797,165	19,259	202,656
Pisgah	81,534	156,827	156,295	23,992	180,287	590,953	12,017	140,665
Cherokee	254,139	435,089	399,311	23,284	422,625	1,742,207	11,570	118,480
Samuel	2,075	3,700	3,700	425	4,125	38	53	3,700
Nantahala	23,771	17,128	16,536	-	16,536	393	194	46,536
Total	630,645	735,031	813,957	57,745	871,633	6,130,756	43,403	542,037

*areas found to be ribes free or ribes population so low that no work will need to be done for five or more years

(1) Actual acreage grid surveyed plus a few ~~plus a few~~ thousand acres of estimated acreage not yet mapped only shown under acres worked for the Chattahoochee

Introduction

A large portion of the present and potential white pine bearing land in Georgia falls within the purchase boundary of the Chattahoochee National Forest. Out of a revised estimate of 863,425 control acres (white pine plus protective zone) 423,437 acres are Federally owned. If the Forest Service continues to purchase land they may eventually control over 70 percent of the white pine bearing lands in the State. Of the 423,437 control acres estimated to be on present Federal holdings, 203,629 acres have been mapped by the grid system, incorporating 163,142 acres of white pine. Most of this white pine is very young with 75 percent or more being under four inches in diameter. The distribution is quite wide with stockings varying from less than 50 stems per acre to well over a thousand per acre.

Under fire protection white pine does exceptionally well and the annual growth rate is probably one of the highest in the country. Wild and cultivated ribes eradication was carried on several years prior to the starting of the Forest Service projects in the spring of 1943 and close to four million bushes were pulled. The bulk of the actual eradication work was in the counties of Murray, Fannin, Gilmer, Towns and Union at elevations usually above 2,500 feet. Because white pine generally grows and does its best at elevations lower than this, many of the old ribes areas are being discontinued as a result of the present grid survey and through general reconnaissance.

From a blister rust disease standpoint the future of white pine in northern Georgia looks very bright. So far no blister rust, either on ribes or white pine, has been found.

Acres Surveyed and Post Checked 1943

	<u>Within Forest Boundary</u>	<u>Federal Lands Only</u>
Surveyed and mapped:		
Acres white pine	74,858	53,963
Acres control	83,160	58,999 (White pine plus
Acres post checked	8,540	8,540 protective zone)

Acres surveyed within Forest boundary comprise intermingled Federal and private holdings.

Of the 74,858 acres of white pine mapped 56,697 acres averaged better than 50 stems per acre.

Only 213 acres of crew work were needed on the 8,540 acres post checked.

The surveys only turned up four acres of initial crew work to do.

Ribes Eradication 1943

	<u>Initial</u>	<u>Rework</u>	<u>Total</u>
Acres worked by crew.....	4	215	219
Acres Ribes free.....	58,955	2,315	61,270
Total acres covered.....	58,959	2,530	61,489
Ribes destroyed.....	376	7,090	7,466
Total man days expended.....			1,840
Total cost of project:			
Labor.....			\$7,501.17
Supervision and operation.....			3,273.73
Total cost.....			\$10,774.90

Work Remaining to be Done

By referring to the attached progress map there still seems to be a large amount of survey work remaining to be done. However probably over fifty percent of the area colored yellow will be eliminated through a general reconnaissance. In 1943 over 120,000 acres were eliminated by such a preliminary survey of private and Federal lands.

Grid surveys will be continued on lands which are definitely white pine sites. As the survey reaches up into the higher elevations of the Blue Ridge Mountains, wild ribes will be encountered but it is doubtful just how many of these old ribes areas will need reworking until white pine conditions are known as a result of the survey.

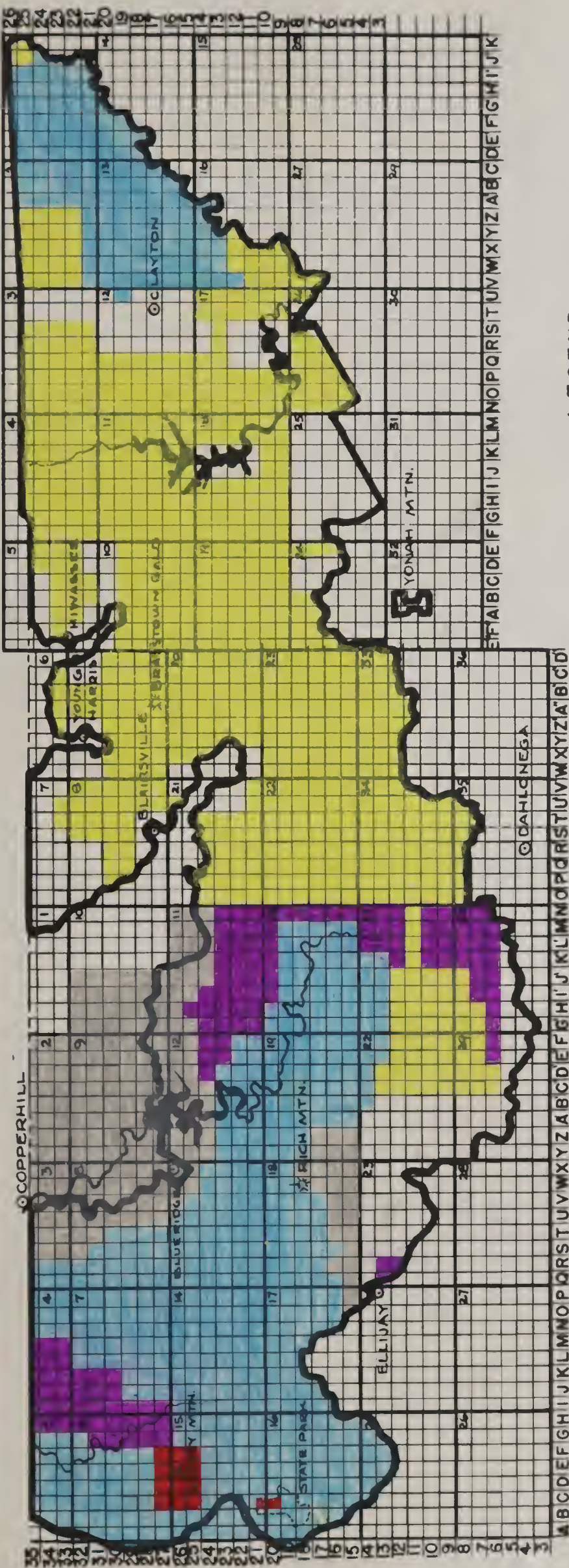
Conclusion

It is very encouraging to note that ribes regeneration has not been unduly heavy in certain ribes eradication areas. For instance, on the Grassy Mountain area which was reworked in 1943 only 7,090 ribes were pulled. Originally over one million bushes were pulled in the same vicinity. The probable reason for this lower regeneration can be attributed to several factors (1) A thorough initial eradication followed by (2) several periods of drought and (3) Increased shade from competing vegetation. Sprouting is not likely to occur in abundance following a good eradication job and ribes seedlings will not survive droughts during the growing season nor will they tolerate much shade.

After the grid surveys are completed which will probably take another year and a half, the cost of maintenance should be very low. Future work will therefore consist mainly of periodically post checking ribes bearing areas which have been worked one or more times to determine whether they need additional working. The Grassy Mountain area can perhaps be left five or more years even before a post check is made.

Attached is a small scale progress map of the Forest depicting the progress of the work accomplished to date and work remaining to be done. The area shaded with green indicates that portion of the control area now eliminated because of the lack of white pine. This was accomplished by general reconnaissance work well in advance of the survey crews.

W. V. Zimmer, State Leader
Blister Rust Control, Georgia



LEGEND

— FOREST BOUNDARY

AREA WORKED INITIALLY $\frac{1943}{\text{YEAR}}$

AREA REWORKED $\frac{1943}{\text{YEAR}}$

AREA WORKED INITIALLY Prior to 1943

AREA REWORKED

AREA UNWORKED General Scouting 1935-1937

Non W.P. - Non Fed. or status Unknown

Acreage Discarded Non W.P.

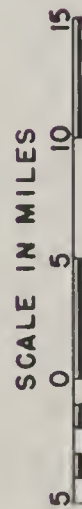
U.S. DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

PROGRESS OF BLISTER RUST CONTROL ON THE

CHATTAHOOCHEE NATIONAL FOREST

GEORGIA



128

PROGRESS REPORT ON THE STATUS OF BLISTER RUST CONTROL WORK
ON NATIONAL FOREST LAND IN NORTH CAROLINA

Introduction

Work first began on national forest lands in North Carolina to protect white pine from blister rust in 1933 and consisted mostly of scouting the white pine areas for ribes. Many of the present white pine areas now on maintenance were not owned by the Forest Service in the early days of blister rust control work or were not taken into consideration because of their young age and lack of commercial importance at that time.

The first blister rust control work was done by C. C. C. labor, then followed by W. P. A. labor during 1935 to 1942, then by the use of workers paid from Regular project funds in 1943. Some C. C. C. workers were used at intervals during the period of 1937 to 1940.

A gradual increase in white pine acreage has been noted from time to time by increased reproduction in previous non-pine or border zones around good white pine areas. This has been noticeable especially in areas where chestnut timber was killed and in abandoned fields with seed trees in the nearby woods. Several hundred acres of white pine plantations have been established, most of which have been worked. Natural reproduction has been favorable in all white pine growing areas in both the Nantahala and Pisgah Forests.

Practically no native ribes have been found near white pine in the Nantahala National Forest; and most of this report will deal with the Pisgah. Native ribes have been eradicated on Pisgah lands in the French Broad District in Haywood County, necessary reworking being completed in 1943. One area of the Pisgah District in Haywood County was checked and found not to be in the need of rework in 1943. In Buncombe County, two white pine plantations were worked in the French Broad District. These two plantations are both some distance from native white pine stands, but the trees in the plantations are making good growth.

In Mitchell County in the Mt. Mitchell District initial working has been completed, most ribes areas have been worked the second time, and a resurvey of the area in the fall of 1945 showed that reworking is necessary in several grids but on less acreage than was formerly overworked. Also, the comeback of ribes has been slow and the bushes are both smaller and fewer than previously. Similar conditions are true in the Flat Top Mountain section of Yancey County.

Ribes bearing areas on National Forest land in Avery County, Grandfather District, are limited to a small holding in the northern part of the county along Elk River. This was last worked in 1940 and will be rechecked in the near future. White pine growing areas in Burke, Caldwell, McDowell, Macon and Watauga Counties have been found free of native ribes.

Blistor rust has been found on ribes in Ashe, Avery, McDowell and Watauga Counties on private land but none on national forest lands. No rust has been found on white pine in the State.

Control Work Performed Prior to the Starting of Forest Service Projects

All white pine growing areas on national forest lands (native white pine) had been worked initially prior to the beginning of Forest Service projects with the majority of the ribes bearing areas placed on a maintenance basis (periodic inspection and reworking only where ribes comeback was enough to endanger the white pines). Following is a brief summary of work performed prior to 1943:

Forest	Protected		Control Acreage Worked Initially	Total No. of Ribes Eradicated
	White Pine Acreage Native	Planted		
Nantahala	23,667	75	46,536	393
Pisgah	80,279	1,233	156,295	586,380
Total	103,946	1,308	202,831	586,773

Of the total control acreage worked (202,831 acres), 92% is ribes free. All acreage in Nantahala is ribes free and 90% of the 156,295 acres in Pisgah is ribes free.

Control Work Conducted Under Forest Service Program

The total control acreage of 202,831 acres has been initially surveyed, either by the grid system in and near native ribes areas or by the "spot map" system in non-ribes areas prior to 1939. Of the total control acreage, 37,090 acres have been surveyed by the grid system.

After the Forest Service project started in the spring of 1943, 18,438 acres were resurveyed in Mitchell and Yancey Counties to determine the actual amount of white pine present and the extent of native ribes to be eradicated. Some of the former maps were incomplete or erroneous in the information given. The following results were obtained with respect to white pine:

	Acreage Examined	Acres Retained	Acres Discarded
White Pine	14,006	11,929	2,079
Control	18,438	15,265	3,173

Note: Some of the acreage examined was outside the previously surveyed zone.

During 1943, 15,265 control acres were surveyed with ribes being found on 4% of the acreage. Part of the survey was during dormant season and post checks in the spring of 1944 may raise the ribes bearing acreage slightly. This control acreage (white pine plus protective zone) incorporates 11,929 acres of white pine with 51% of the acreage supporting over 50 trees per acre.

Ribes Eradication Under Forest Service Project (R&I in 1943)

Ribes eradicated	4,573
Acres found ribes free	18,249
Acres worked by crew	410
Total acres covered	18,659
Total man days used	641
Cost of Project:	
Labor	\$2,721.80
Supervision and operation	552.75

Total amount of Project \$3,274.55

Work Plans Proposed For Remainder of Fiscal Year 1944

To complete survey, post checking and ribes eradication in Yancey and Mitchell Counties and inspect white pine plantations not yet worked.

Future Work Plans and Recommendations

Due to a decided decrease in ribes population on National Forest lands in North Carolina all areas are now on a maintenance basis, (or will be by the end of the fiscal year). Post checking should be done at intervals of from 3-5 years on the ribes bearing areas with necessary reworking performed within the same year as the checking is done or in the following year. An estimated \$2,000.00 once every three or more years will perform necessary post checking and reworking, with the checking to be done early in the spring and eradication work to follow immediately where needed. The best period to conduct ribes eradication is from April 15 to June 30. A resurvey and post check job should be conducted in the Cullasaga River Section of Macon County in the Nantahala National Forest.

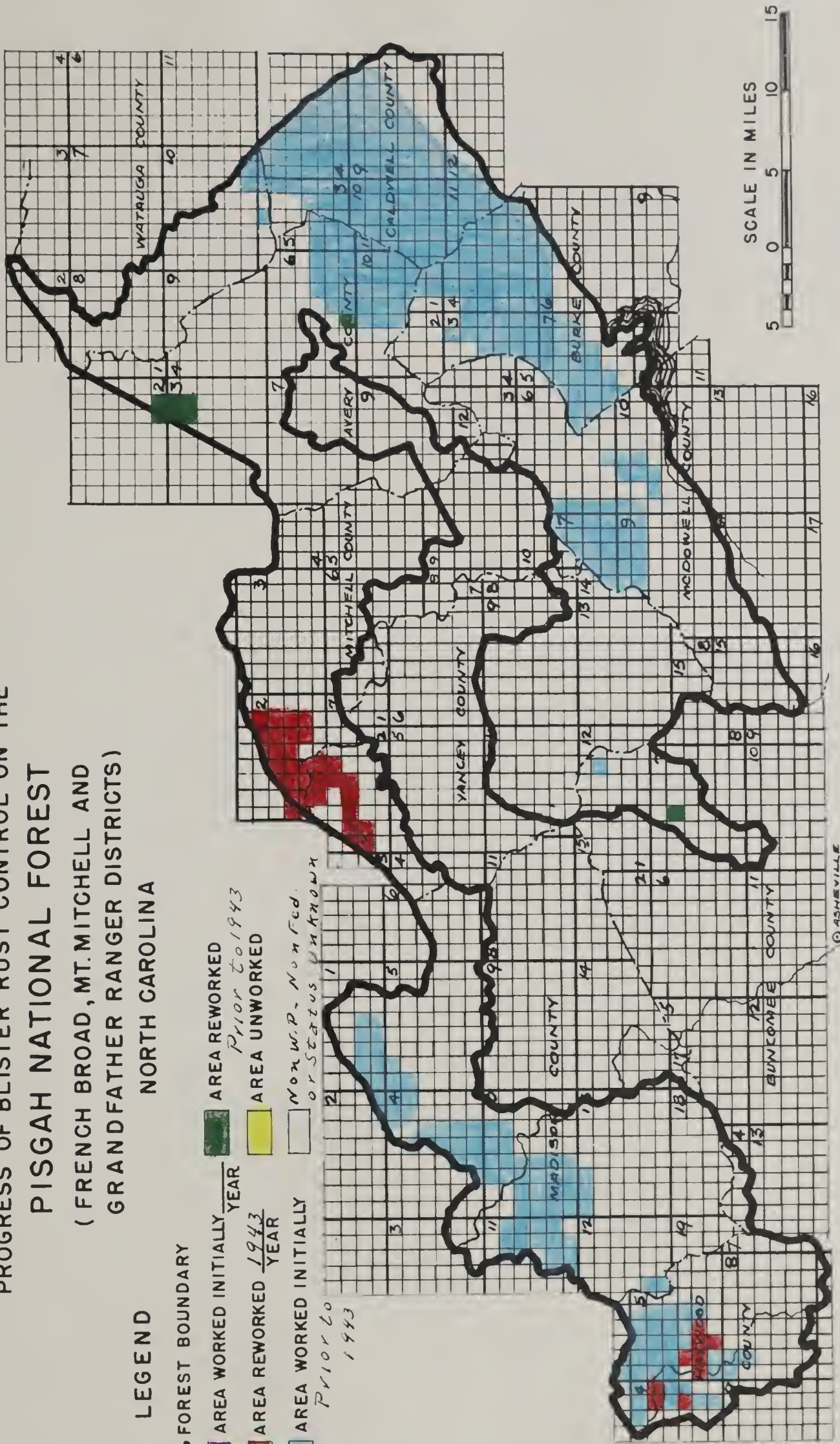
On the next page is a progress map showing the progress of blister rust control on the Pisgan National Forest.

H. B. Teague, Asst. Area Leader
Blister Rust Control
North Carolina

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
PISGAH NATIONAL FOREST
(FRENCH BROAD, MT. MITCHELL AND
GRANDFATHER RANGER DISTRICTS)
NORTH CAROLINA

LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY
YEAR 1943
- AREA REWORKED 1943
- AREA WORKED INITIALLY
Prior to 1943
- AREA REWORKED
Prior to 1943
- AREA REWORKED
Prior to 1943
- AREA UNWORKED
- Non W.D. Non Fed.
or STATUS UNKNOWN



REPORT OF PROGRESS OF WHITE PINE BLISTER RUST CONTROL OF THE
CHEROKEE NATIONAL FOREST IN TENNESSEE

1943

Introduction

The first white pine blister rust control work was started in Tennessee in 1933 on U. S. Forest Service lands. A blister rust checker employed by the Forest Service did inspection, mapping and eradication on what was known as Unaka and Cherokee Forest, later combined into the Cherokee National Forest. This work was continued in 1934 by a checker employed by the Bureau of Entomology and Plant Quarantine.

Beginning in 1933 and 1934 the Forest Service checkers used some C. C. labor. In 1934, the Bureau of Entomology and Plant Quarantine conducted blister rust control work, which was continued up to the start of the present Forest Service program, using N. I. R. A., P. W. A., and W. P. A. labor. Most of the early work was accomplished by Federal and State-sponsored W. P. A. projects.

The present Forest Service blister rust control project was begun in Polk County on February 2, 1943, using local labor which was trained and supervised by the Bureau's agent. Polk County was completed in August and the work was then extended into Monroe County where work is still being performed.

White pine has spread very rapidly by natural reproduction in all areas mapped and worked thus far. It has replaced many large stands of chestnut trees which were killed by the blight. Through December 31, 1943, a total of 22 native white pine counties have been mapped and protected and 60,360 acres containing 20,380 acres of white pine have been mapped and protected in Monroe County. Monroe is the last county to be mapped and protected on initial coverage. Ten of the 22 counties mentioned contain valuable areas of white pine on national forest lands. Eradication work which covers the removal of wild and cultivated ribes has been performed in the following counties which contain national forest acreage: Sullivan, Johnson, Carter, Washington, Greene, Unicoi, Cocke, Blount, Polk and Monroe.

Approximately 95 percent of the national forest acreage covered thus far has been classed as "Ribes free", which means that no additional work will be necessary. This is due to the ribes being concentrated in definite areas on northern slopes and seldom below 2,500 feet.

White pine has been classed as one of the most versatile trees in the forest, due to its rapid growth, ability to reproduce rapidly, and its wide usage. It is very valuable commercially due to rapid growth, wood value, and it has established itself as a cash money crop tree. Fire suppression is very important to its growth and survival, as well as disease control. The fire control program carried on by Forest Service has been a big factor in its reproduction and growth.

A considerable amount of variation has been found in ribes regeneration, due to shade, droughts and thorough eradication work. In some locations the first work proved to be sufficient as there was little or no regeneration while in others the areas had to be worked very thoroughly the second time. The factors mentioned above have great effect on regeneration; namely, shade, droughts and thorough eradication. In places where numerous droughts have occurred the young seedlings have been killed. It has also been observed that a thickening of the understory, causing heavy shade, has killed ribes bushes. Fire prevention helps greatly in making ribes regeneration unfavorable by allowing the understory to grow densely and by keeping down heavy sprouting. Where a fire burns over a ribes area a very heavy growth of succulent growth generally follows.

In October, 1941, white pine blister rust was found for the first time at Willen Gap in Johnson County and on Hampton Creek in Carter County. No further spread has been discovered since that date. The rust was discovered on *Ribes cynosbati* in both counties, but no cankers have been discovered on white pine.

Control Work Performed Prior to the Starting of Forest Service Projects

Through December 31, 1942, a total of 222,215 acres have been worked initially in the control area to protect 158,000 acres of white pine. A total of 1,726,354 wild and cultivated ribes have been pulled and destroyed from this area. A total of 23,161 acres has been reworked and 14,863 wild and cultivated bushes have been removed on recovery of the ribes areas.

Control Work Conducted Under Forest Service Program - 1943

Acres Surveyed

Surveyed and mapped:

Acres white pine 96,139

Acres control 177,126 (White pine plus protective zone)

51,979 acres of the total 96,139 acres mapped averaged more than 50 stems per acre.

Ribes Eradication

Number of acres worked by crew	3
Acres Ribes free	177,126
Total acres worked	177,126
Man days (all activities)	1,976
Cost of project:	
Labor	\$5,496.21
Supervision and operation	3,358.40
Total cost of project	\$8,854.61
Total acres white pine protected	96,139

123 Acres were removed in Barber County on Forest Service lands in conjunction with our regular-cooperative project. No Forest Service funds used. 92 men were pulled.

Work Plan Proposed for Calendar Year 1944

Survey to be done	125,000 acres
Resurvey to be done	1,500 "
Estimated initial eradication (Acreage depends on survey)	
Reeradication to be done	500 Acres
(Depends on post check, mostly in Unicoi County)	

Future Work Plans

If present work plans are completed it is believed that Monroe County can be finished by June 30, 1944. After this work is finished plans have been made to check former eradication work in Unicoi County and if the ribes are numerous enough to justify additional work we will remove the necessary acreage to protect the white pine in that County. Post check will be run prior to any ribes eradication.

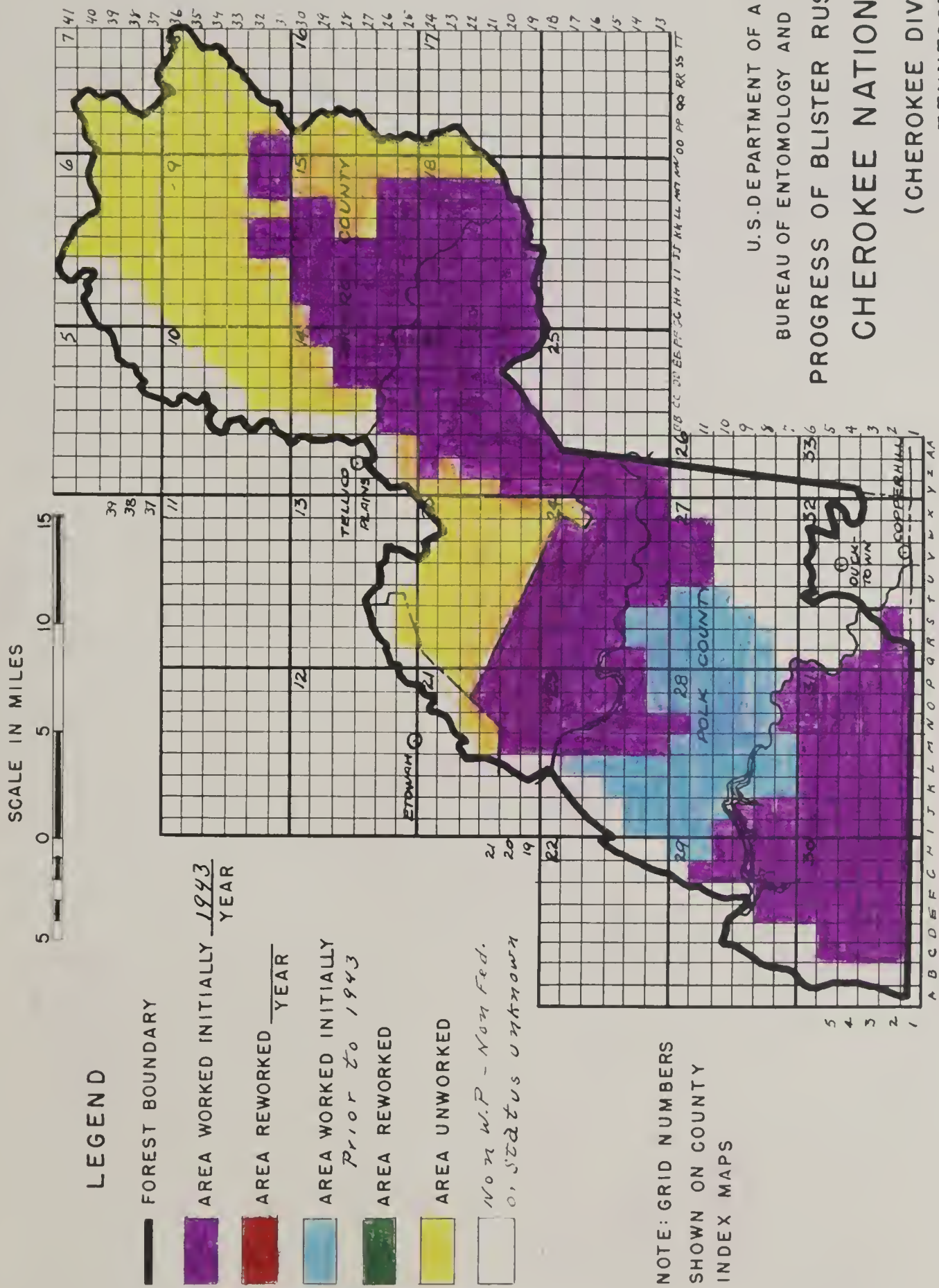
Recommendations

If possible, local labor should be used and from six to ten experienced full-time workers should be employed. I would like to suggest that we continue to operate the blister rust control camp in Monroe County and employ a cook, due to travel distances and labor conditions. The present trained crew should be kept and moved around with the camp. This will help cut down on travel cost and time, allowing the men to get in more actual field work. Local labor in the mountainous sections have not been extremely hard to get to carry on the limited amount of work we have to do.

Status Maps

The attached map shows progress of work done in Tennessee. A certain percentage of the area colored yellow will probably be eliminated because of little or no white pine. General reconnaissance work will determine this.

R. L. Tanksley, State Leader
Blister Rust Control, Tennessee



LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY 1943 YEAR
- AREA REWORKED YEAR
- AREA WORKED INITIALLY Prior to 1943
- AREA REWORKED
- AREA UNWORKED
- No W.P. - Not Fed. or Status unknown

NOTE: GRID NUMBERS SHOWN ON COUNTY INDEX MAPS

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
CHEROKEE NATIONAL FOREST
(CHEROKEE DIVISION)
TENNESSEE

SUMMARY OF RIBES ERADICATION ON NATIONAL FORESTS - 1943

NATIONAL FORESTS	INITIAL WORK				REERADICATION WORK				TOTALS	
	Acreage Worked	No. Ribes Destroyed	No. 8-Hr. Man-Days	Acreage Worked	No. Ribes Destroyed	No. 8-Hr. Man-Days	Acreage Worked	No. Ribes Destroyed	No. 8-Hr. Man-Days	
Chattahoochee - Ga.	58,959	376	458	2,560	7,090	262	61,519	7,466	720	
Pisgah - N. C.	-	-	-	18,659	4,573	291	18,659	4,573	291	
Cherokee - Tenn.	177,126	-	(1)	123	990	76	177,249	990	76	
Geo. Washington - Va.	-	-	-	49,346	471,926	2,530	49,346	471,926	2,530	
Jefferson - Va.	-	-	-	32,634	54,516	282	32,634	54,516	282	
Geo. Washington - W. Va.	-	-	-	15,979	27,158	471	15,979	27,158	471	
Monongahela - W. Va.	1,848	12,400	183	42,980	26,261	1,285	44,828	38,661	1,468	
Combined Geo. Wash. Va. and W. Va.	-	-	-	65,325	499,084	3,001	65,325	499,084	3,001	
TOTALS	237,933	12,776	641	161,710	572,514	5,197	399,643	585,290	5,838	

Wild and cultivated ribes. (1) All initial acreage was blackout. All man days charged to survey.

TABLE #4A, SHEET #9

SUMMARY OF RIBES ERADICATION ON NATIONAL FORESTS 1918 - 1943 (INCLUSIVE)

NATIONAL FORESTS	NET CONTROL AREA				INITIAL ERADICATION WORK				Gross Net 8-Hour Man Days
	Acreage of White Pine in Net Control Area	Total Acreage (W.P. & Prot. Zones)	Acreage Yet Worked Initially	Net Acreage Reported Worked	Gross No. Wild & Cultivated Ribes Destroyed	Acreage Yet Worked Initially	Net Acreage Reported Worked	Gross No. Wild & Cultivated Ribes Destroyed	
Chattahoochee - Ga.	269,121 (1)	425,437 (1)	-	527,349	423,457 (1)(2)	3,712,136	18,778	3,712,136	18,778
Cumberland - Ky.	14,478	30,565	-	30,565	30,565	2,095	337	2,095	337
Pantahala - N. C.	23,771 (1)	47,128	592	46,536	46,536 (1)	393	494	393	494
Pisgah - N. C.	81,534 (1)	156,627 (1)	332	156,295	(1) 156,295	539,655	10,450	539,655	10,450
Sumter - S. C.	2,075	3,700	-	3,700	3,700	38	53	38	53
Cherokee - Tenn.	254,139 (1)	435,089	35,748	399,341	399,341	1,726,554	11,072	1,726,554	11,072
Geo. Wash. - Va.	70,579 (1)	181,229 (1)	53,871	127,358	127,358	1,248,925	12,121	1,248,925	12,121
Jefferson - Va.	27,344 (1)	72,063 (1)	36,546	35,517	35,517	576,907	7,068	576,907	7,068
Geo. Wash. - W. Va.	21,123	48,417	-	48,417	48,417	505,011	4,817	505,011	4,817
Monongahela - W. Va.	29,000	80,000	2,328	77,672	77,672	338,585	3,724	338,585	3,724
TOTALS	795,164	1,478,255	129,417	1,452,750	1,548,838	6,650,099	68,725	6,650,099	68,725

(1) Acreage adjusted to agree with Permanent Control Records.

(2) Of this acreage 203,629 acres have actually been mapped by grid survey.

TABLE #44, SHEET #10
SUMMARY OF RIBES ERADICATION ON NATIONAL FORESTS 1918 - 1943 (INCLUSIVE)

NATIONAL FORESTS	ERADICATION WORK					TOTALS		
	Gross Acreage Reported	Net Acreage Reworked in Control Area	Gross No. Wild & Cult. Ribes Destroyed	Gross No. 8-Hour Man Days	Gross Initial and Reworked Acreage Reported			
		1st.						
Chattahoochee - Ga.	10,045	7,486	2,559	481	557,394			
Cumberland - Ky.	55	55	-	(1)	30,620			
Nantahala - N.C.	-	-	-	-	46,536			
Pisgah - N.C.	151,985	17,860	6,132	1,559	308,280			
Sumter - S.C.	425	425	-	10	4,125			
Cherokee - Tenn.	23,284	23,284	-	496	422,625			
Geo. Wash. - Va.	120,779	120,000	779	12,278	248,137			
Jefferson - Va.	36,026	30,000	6,026	5,669	71,543			
Geo. Wash. - W.Va.	29,763	29,763	-	1,105	78,180			
Monongahela - W.Va.	46,811	46,811	-	1,537	124,485			
TOTALS	419,173	275,684	15,496	23,135	1,871,923			

(7) Agent's work

TABLE #44, SHEET #10 (Continued)

NATIONAL FORESTS	TOTALS (Initial & Re-Work)					Gross Number 8-Hour Man-Days	
	Net Acreage-Initial and Re-Work	Initial	1st Re-Work	Other Reworkings	Gross No. Wild & Cultivated Ribes Destroyed		
Chattahoochee - Ga.	7,486	424,437	2,559	-	3,764,980	19,259	
Cumberland - Ky.	55	50,565	-	-	2,104	537	
Nantahala - N.C.	-	46,536	-	-	393	494	
Pisgah - N.C.	17,860	156,295	6,132	-	590,953	12,017	
Sumter - S.C.	425	3,700	-	-	38	65	
Cherokee - Tenn.	23,284	399,341	-	-	1,742,207	11,570	
Geo. Wash. - Va.	120,000	127,558	779	-	2,334,889	24,399	
Jefferson - Va.	30,000	35,517	6,026	-	1,379,195	12,737	
Geo. Wash. - W.Va.	29,763	48,417	-	-	611,205	5,722	
Monongahela - W.Va.	46,811	77,672	-	-	417,119	5,265	
TOTALS	275,684	1,348,838	15,496	-	10,843,083	91,863	

TABLE #7A, SHEET #3
BLISTER RUST CONTROL WORK PERFORMED ON NATIONAL FORESTS
(Acreage Data 1943 and 1918 - 1943 Inclusive)

NAME OF FOREST	STATE	Net Acreage in Control Areas	Period Calendar Year	Acreage Eradicated of Ribes by Forest Service			
				First Working	Second Working	Subsequent Working	Total
Chattahoochee	Georgia	423,437	1943	58,959	1	2,559	61,519
Cherokee	Tenn.	435,089	"	177,126	-	-	177,126
Cumberland	Ky.	30,565	"	-	-	-	-
Geo. Wash.	Va.	181,229	"	-	44,410	4,936	49,346
Geo. Wash.	W. Va.	48,417	"	-	15,979	-	15,979
Jefferson	Va.	72,063	"	-	26,037	6,026	32,063
Monongahela	W. Va.	80,000	"	1,848	42,980	-	44,828
Nantahala	N. C.	47,128	"	-	-	-	-
Pisgah	N. C.	156,627	"	-	12,567	6,092	18,659
Sumter	S. C.	3,700	"	-	-	-	-
TOTALS		1,478,255	1943	237,933	141,974	19,613	399,520
All National Forests		1,478,255	'18 - '38	143,659	39,219	-	182,878
			1939	-	-	-	-
			1940	16,917	-	-	16,917
			1941	-	-	-	-
			1942	-	28,545	403	28,948
			1943	237,933	141,974	19,613	399,520
TOTALS		1,478,255	'18 - '43	398,509	209,738	20,016	628,263

Funds were provided by the Forest Service for this work which was administered under the direction of the Bureau of Entomology and Plant Quarantine.

TABLE #7A, SHEET #4
BLISTER RUST CONTROL WORK PERFORMED ON NATIONAL FORESTS
Acreage Data

NAME OF FOREST	State	Year	Acreage Worked by Forest Service and Bureau				Gross Acreage	
			Second Working	1st Work	2nd Work	Subsequent Working	Reported Initially Worked	Unworked Acreage
Chattahoochee	Georgia	1943	-	58,959	1	2,559	61,519	527,349
Cherokee	Tenn.	"	123	177,126	123	-	177,249	399,341
Cumberland	Ky.	"	-	-	-	-	-	30,565
Geo. Wash.	Va.	"	-	-	44,410	4,936	49,346	127,358
Geo. Wash.	W. Va.	"	-	-	15,979	-	15,979	48,417
Jefferson	Va.	"	-	-	26,037	6,026	32,063	35,517
Monongahela	W. Va.	"	-	1,848	42,980	-	44,828	77,672
Nantahala	N.C.	"	-	-	-	-	-	46,536
Pisgah	N.C.	"	-	-	12,567	6,092	18,659	156,295
Sumter	S.C.	"	-	-	-	-	-	3,700
TOTALS			123	237,933	142,097	19,613	399,643	1,452,750
								129,417

BUREAU

BOTH AGENCIES

NATIONAL FORESTS	Year	First Working				Second Working				Third Working				Gross Acreage	
		Total	Subsequent Working	First Working	Second Working	Total	Subsequent Working	First Working	Second Working	Total	Subsequent Working	First Working	Second Working	Reported Initially Worked	Unworked Acreage
'18-'38		806,506	6,080	855,049	128,255	989,584								-	-
1939		145,776	-	99,568	46,208	145,776								-	-
1940		168,099	1,410	163,671	19,935	185,016								-	-
1941		102,687	9,048	68,991	24,648	102,687								-	-
1942		14,747	40	11,238	32,014	43,695								-	-
1943		123	-	237,933	-	399,643								-	-
TOTALS		1,237,938	16,578	1,237,938	1436,450	1866,201								1,436,450	129,417

Reconciliation to agree with Table 4A, Sheets 9, 10, 16, 300 -10,578 5,722 16,300
Corrected totals agreeing with 1,452,750 1,871,923 1,452,750
Table 4A, Sheets 9 and 10

Blister Rust Control on National Parks
in the Southern Appalachian States

1943

Foreword

There are three national park units in the Southern Appalachian States, viz; the Shenandoah in Virginia, the Blue Ridge Parkway in Virginia and North Carolina, and the Great Smoky Mountains in North Carolina. Blister rust control began in the two Parks in 1933, but not in the Parkway until 1941. Pine surveys and ribes eradication have in the past been carried on cooperatively by both the Park Service and the Bureau of Entomology and Plant Quarantine. In 1943, however, all of the pine survey and eradication work was carried on by the Park Service with only technical assistance and training provided by the Bureau.

By the end of 1943, practically all of the white pine areas in the two Parks had been covered once with some areas worked two, three and four times. In the Parkway there remains a considerable acreage of pine yet to be surveyed. Surveys which have been made show 73,579 acres of white pine in the three ^(Parks) States with a control area of 131,510 acres. 2,611,860 ribes have been removed in the eleven years of work, from 1933 to 1943 inclusive. All of the pine areas in the Great Smoky Mountains National Park except approximately 600 acres in North Carolina in Cataloochee Creek valley are considered ribes-free, hence will need no further work. A very large proportion of the Blue Ridge Parkway is also ribes-free, but exact figures are unavailable as yet. In the Shenandoah National Park most of the areas along Skyline Drive have been the habitats of large numbers of ribes. There, the ribes population is being kept down however by repeated workings. That progress is being made in ribes suppression is shown by the fact that in most of the pine areas in the Shenandoah Park the workings of the last three years have shown only from a tenth to a half as many bushes per acre as in the initial working.

Following are reports for 1943 work by Messrs. Yost and Teague of Virginia and North Carolina respectively.

Blister Rust Control Work in Virginia - 1943
Report by Mr. H. E. Yost, Area Leader, Harrisonburg, Va.

BLUE RIDGE PARKWAY 1943

Eradication

Some years ago landscape architects employed by the Blue Ridge Parkway designated certain areas by section and station numbers on which it was believed that white pine is of sufficient value to the Parkway to warrant protecting it against white pine blister rust. Beginning April 20, a crew from the Lyndhurst C. P. S. camp was assigned to this work. A strip check was made of the park property together with a control zone approximately 900 feet in width to determine the distribution and concentration of wild ribes bushes. These data were recorded on a map scaled 1" = 300 feet showing the park property lines, center line of the parkway, station and park property line corner numbers. On the basis of data collected on this survey, those areas found to be ribes-free were blocked out as requiring no further consideration. Where wild ribes were found, a line surrounding the parkway property and a 900 ft. control zone was surveyed and marked on the ground. The eradication of the ribes was then conducted in the usual manner.

Three areas were surveyed and where necessary, ribes eradication work was carried on. The following tabulation gives the results of the findings and work. The white pine acreage represents generally the land owned by the Park Service and includes as well as land actually bearing white pine, some white pine planting sites, fields and small strips having no white pine but being so interlocked with the white-pine-bearing sections or planting sites that protection is automatically provided for this ground in the process of protecting the adjacent sections.

SUMMARY BLISTER RUST CONTROL WORK NORTH OF ROANOKE

Area	Ribes- Bearing Acres	Ribes- Free Acres	Total Acres	Acres White Pine	Hours Survey	Hours Erad.
Clarks Gap	1	145	146	12	34	16
Irish Gap	87	678	765	173	336	322
Tye River Gap	769	216	985	270	628	2,252
Total	857	1,039	1,896	455	998	2,590

Area	Hours Miscellaneous*	Total Hours	Ribes Destroyed
Clarks Gap	-	50	101
Irish Gap	55	713	2,211
Tye River Gap	269	3,149	11,912
Total	324	3,912	14,224

* Office overhead prorated.

Clarks Gap. This area extends from Station 128 to 147 in Section 1-F. Wild ribes were found on only one small area which was near the outer limits of the control zone. Maintenance of control in this section in the future will not present any serious problem.

Irish Gap. This area extends from Station 480 in Section 1-E southward to Irish Gap and from the beginning to Station 97 in Section 1-F. Wild ribes were found on a relatively small percentage of the total area and confined almost entirely to the northward end of the area. Some attention will be required in the future in order to maintain control. Probably 30 man days will be required to rework the area and it is not likely that any additional work will be required before 1945 or later.

Tye River Gap. This area is located in Section 1-E and extends from about Station 23 to Station 243. Wild ribes were found in heavy concentrations southward to about Station 60 and were either absent or relatively few were found throughout the remainder of the area. Blister rust infection was found on a few hundred feet of the property. It is likely that in the near future small amounts of infection will

Tye River Gap (Continued)

be found on parkway property since a period of three or more years elapsed between the time of infection and the time that it becomes readily visible on pine. A considerable part of this area, particularly southward from Station 175, is covered with dense brush which makes it particularly difficult to locate and destroy all of the ribes. At the same time this dense ground cover tends to suppress the ribes that are present and prevent, to a large extent, the regeneration of bushes in the future. A large part of this area was reworked this year because the close proximity of blister rust provides an immediate source of ascia spores and increases the chances of small bushes becoming infected and causing damage to the pine. It is recommended that if possible this area be checked during the spring of 1944 to determine more accurately the need for additional working. Probably not more than 200 man days will be required to rework this area and it is believed that no additional work will be required before 1945 or later; however, a check next spring would give a more accurate estimate as to the future requirements.

Systematic or general checks were made of all of these areas following eradication. In the case of the Clarks Gap area the bushes remaining are practically nil. In the case of Irish Gap and Tye River Gap areas the checks indicated less than 15 ft. of live stem per acre for the areas as a whole before any reworking was performed. Since the rework was completed no systematic check has been made on this work but it can safely be assumed that the ribes population is now at a safe level, probably considerably less than 10 feet of live stem per acre for these two areas as a whole.

At the same time work was continued on locating and destroying cultivated bushes south of Adney Gap. Mayo L. Cox was employed for a short time prior to June 30 and Adam L. Helms during the latter part of the summer. There were 147 cultivated bushes destroyed; 108 places were examined and all of the bushes found were destroyed except seven bushes at three locations. Mr. Campbell, Chief Ranger, believes that the bushes at least two of these, can be secured when further contacts are made.

The laborers from the C. P. S. camp at Lyndhurst mapped and did eradication work where necessary on 1896 acres in the above mentioned three areas, and 14,824 wild ribes were destroyed. The checking indicated satisfactory work except in one small area which was covered again by the crew. All of this work was regarded as initial despite the fact that there was some evidence that work had been done previously in the vicinity of Irish Gap. If such work were performed in the past it was probably about 1936. From the standpoint of ribes population no marked difference could be observed between this and any other area.

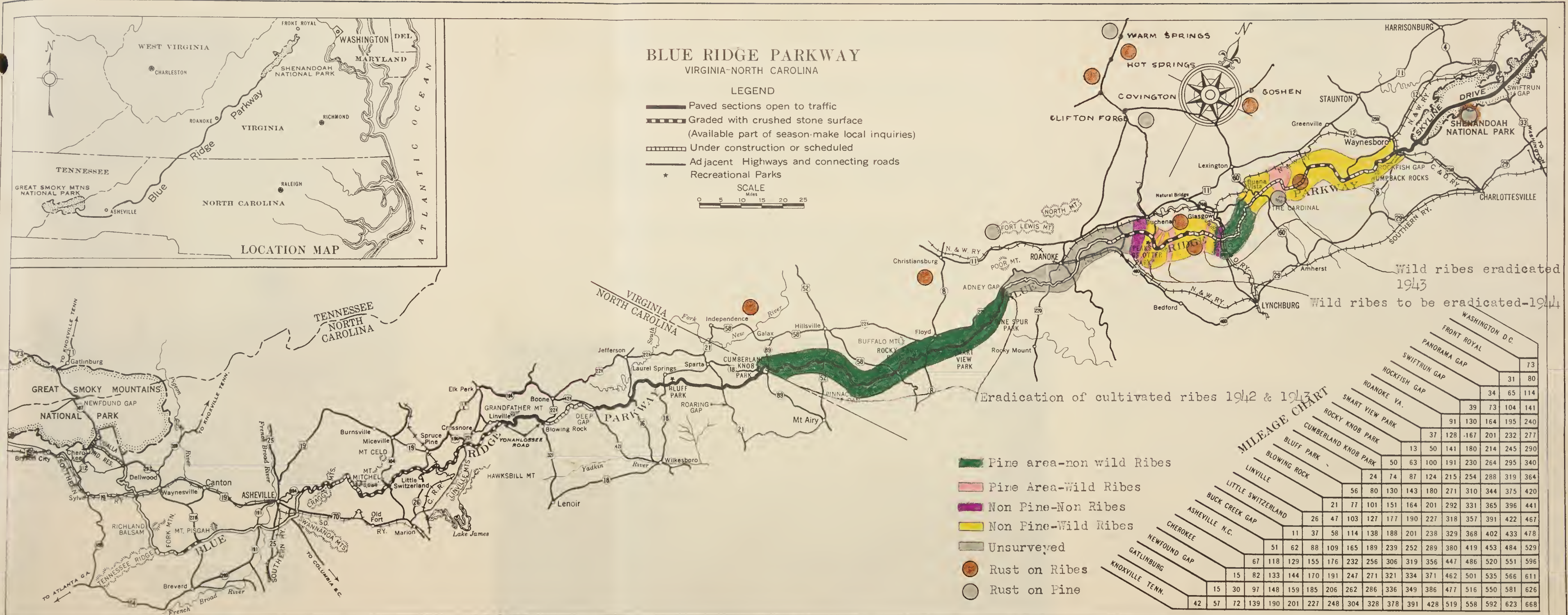
The white pine at Petites Gap was protected by men employed on the Jefferson National Forest Project since these men were working in the immediate vicinity and a larger portion of the white pine in this area is owned by the Forest Service.

Plans for 1944

According to present plans, the C. P. S. camp will be moved from Lyndhurst to a point near Bedford well in advance of the eradication season. Some work remains to be done at Wilkinsons Gap, Peaks of Otter and possibly at the utility area in the same general vicinity. Mr. B. F. Campbell has recently entered the Armed Forces and blister rust work will be taken over by Mr. Wilbur L. Savage. Plans have been made for making an inspection of these areas and determining what areas are to be surveyed. The pine to be protected will then be determined on the basis of the ribes population and distribution as well as other factors. 200 man-days are set up for this work to June 30 and in all probability, upwards of 500 additional man-days will be required either during June or for the period beginning July 1.

The Status of the Rust

To date no blister rust has been found on white pine on parkway property. It was found on ribes in 1942 a few miles north of Route U. S. 60 and generally distributed along the Tye River Gap eradication area during this year. In the course of the work on this area infection was found on white pine near the parkway property at Tye River Gap. One location was found on which most of the white pine trees on about one-half acre were found infected. This is located about 200 yards from the utility area south of Tye River Gap and the infection originated about 1934. Another lighter infection was found on the eastward side of the parkway about one-half mile south of Tye River Gap proper. The presence of the rust in the immediate vicinity of parkway holdings makes it necessary that careful post checking and eradication be continued for some years. It is probable that a few trees on parkway holdings are infected. Periodic examination should be made and should such infected trees be found they should be salvaged by canker elimination work if, in the opinion of parkway officials, the individual trees warrant expenditure of the necessary time or funds.



SHASTA NATIONAL PARK

Ribes Eradication

During 1943 eradication work was continued under the supervision of Mr. Roy C. Sullivan, who was paid from Regular Park Service Funds, and using labor from the C. P. S. camp at Luray. A total of 885 acres were covered and slightly more than 30,000 ribes destroyed. The work was confined to the following areas: Big Meadows, Skyland, Pinnacles, Pass Mountain and Elk Wallow Gap.

Survey Work - 1943

Survey work was carried on by the same group as was eradication and in addition an 8-man crew was assigned from the Soil Conservation Service C. P. S. camp at Grottoes for a short period during the late winter and early spring. A total of approximately 4,000 acres were mapped, the areas being Madison Run, Big Run, Browns Gap, Doyle River, Rocky Bar, Simmons Gap, Gap Run, Hazel Mountain and Hazel Road. All of the survey work was carried on by the grid method.

Plans for 1944

Survey work will begin near the first of the year and continue in the north end of the park using labor from the C. P. S. camp at Luray. It is hoped to map most of the old pine areas as a basis of determining which shall be discontinued. Several of the old areas mentioned in former reports have already been abandoned. Tentative arrangements have been made for securing a survey crew from the Soil Conservation Service C. P. S. camp at Grottoes to complete the mapping in the southern end of the park. The principal unmapped area there is in the drainage area of Moorman River. This will probably not begin until late winter or at such time as Mr. Sullivan has a crew from the Luray Camp trained to such a point that they can carry on with a minimum of supervision. Eradication work will be continued beginning in the spring with the work starting at Big Meadows area where it was discontinued in the fall of 1943. By the end of the calendar year 1944 it is hoped that all the resurvey work on the park will have been finished and a definite statement can be prepared regarding the pine and acreage on which blister rust control work will be continued.

Checking

During the year regular checks were run on all the crew-acreage worked, or 845 acres. The checking was done by Mr. Sullivan or C. P. S. men under his immediate supervision. General checks made behind the crews by other persons indicate that not only the checking but eradication work was very satisfactory.

Status of the Rust

No marked change has been noted in the development of the rust from last year. General observations indicate that the degree of infection on ribes was about average and no new developments were found on pine. A considerable amount of infection was found at Hawksbill on pine and probably some canker elimination work will be necessary during the next year or two.

Recommendations for 1944

Reeradication during 1944 is proposed for Big Meadows, Presidents Camp, Hawksbill and Spitler Areas, totaling 850 acres supporting over 25 feet of live stem per acre. In addition, considerable advance checking need to be done, particularly on the control areas located in the South District. Some of these smaller, second priority areas may be cleared of ribs following advance checks depending upon time and available labor.

Pre-eradication survey is reported 75% complete for the park. Mapping will be continued by C. P. S. crews under Checker Sullivan during the early months of the year and to a lesser degree during the summer months.

Canker Elimination

During the year canker elimination work was carried on as follows at Pinnacles:

No. Trees Examined	957
No. Trees Treated	99
No. Trees Removed	10
Stem Cankers Removed	6
Branch Cankers Removed	123
Acreage Covered	62
Man Hours Used	192

GREAT SMOKY MOUNTAINS NATIONAL PARK

Eradication

Ribes eradication, post checking and regular checking were performed in the Cataloochee Creek section of Haywood County during 1943, with eradication work being done by C. P. S. workers under the supervision of a Regular foreman, Beauford C. Messer. Technical supervision was furnished for the National Park by Mr. W. R. Savage, Forester, and the State leader assisted in training workers.

All 1943 work was performed in grids which had been worked initially, thus the number of bushes and feet of live stem found were considerably less than that found originally. In 10 grids worked, 556 acres were covered, 336 on first reworking and 220 on other reworking. There were 7,520 ribes eradicated in 1943 as compared with 92,584 bushes in all previous workings, or 8% as many in 1943 as had been removed previously. A total of 289 man days of labor was spent by the C. P. S. crews for which \$1,011.50 was credited at \$3.50 per man day.

Checking

Mr. Savage requested clean eradication, and checking results show that this was obtained. Most of the grids showed no ribes on the Regular checks, and areas which I examined personally showed that a good piece of work was done.

Most of the checking was done by Foreman Messer with some additional checking performed by Agent Whitman and the State leader. Post checking included 16.35 strip acres, representing a 3.84 percent coverage of 426 acres. This required 31 man-hours time. Regular checking consisted of 13.9 strip acres which represented a 5.07 percent coverage of 274 acres.

Close cooperation was maintained between Mr. Savage, Mr. Messer, and the State leader with frequent inspections made to see that the work was being done right and that good progress was made. Upon completion of the work we summarized the data and furnished Mr. Savage with a copy of the records including AP-14 ledger sheets. On these records were recommendations for future workings.

Status of the Rust

No rust has ever been found in this park.

Recommendations for 1944

It is recommended that a survey be made of the white pine on Bumgardner Ridge in Swain County where early reports from Joseph Manley, Checker on the Park in 1933 and 1934, showed that Ribes were present. This survey had been planned for 1943 but was not carried out.

Since all ribes areas in Cataloochee Creek have been reworked in 1943, no further work in the section seems necessary for several years.

NOTES ON GREAT SMOKY MOUNTAINS NATIONAL PARK IN TENNESSEE

By: Roy G. Pierce,
Pathologist-in-Charge.

FOREWORD

Scouting for white pine, ribes and the blister rust began in Tennessee in 1917, the original work being carried on by Professor Alban Stewart working under my general direction. The area scouted included lands later taken in to the National Park. No wild ribes were found by him near white pine in the area covered, nor was the rust discovered in the State.

More detailed scouting for white pine and ribes was next carried on ^{in 1933} by Mr. Joseph Manley, at that time blister rust checker attached to the Park Service. No wild ribes were found by Mr. Manley within the white pine area. Some 1,825 acres of white pine in Tennessee were scouted. 16 ribes bushes were destroyed, 14 of them being cultivated bushes at abandoned house sites in Cades Cove, and 2 being wild which were found higher in the mountains.

LATER SURVEYS

Mr. J. W. Lane, blister rust agent working for the Bureau in cooperation with the Park Service, began his detailed surveys for white pine in the park in 1940, continuing it in 1941 and 1942, finishing it in the latter year. In all, Mr. Lane surveyed 45,525 acres of white pine in the park in Tennessee, the control area surveys being 76,708 acres. He found and destroyed 121 additional gooseberry and currant bushes, bringing the total destroyed to date up to 137. A total of 471 8-hour man days labor were used in the survey and eradication work through 1942. No work was carried on in the park in Tennessee in 1943.

Because of the absence of wild ribes in the park in or near white pine areas on the Tennessee side, there is no need of further scouting or surveys to be carried on there for some years. Should the white pine because of protection invade the higher up ribes-bearing areas above 3,000 feet in elevation, then there would be need for further survey and eradication work.

RECOMMENDATIONS

An occasional check by Park Rangers of old house sites throughout the park might reveal some missed cultivated or escaped currants and gooseberry bushes. To this end, a collection of specimens of cultivated gooseberries, European black currants, the spice bush or yellow flowering currants, american black currants, and the cultivated red currants will be made if possible by blister rust employees in 1944 for the National Park herbarium. It is believed that the park already has a collection of native ribes from the mountain tops and upper coves.

Survey and eradication figures are to be found in tables following.

SUMMARY OF RIBES ERADICATION ON NATIONAL PARKS - 1943

NATIONAL PARKS	INITIAL WORK				REERADICATION WORK				TOTALS		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Blue Ridge Pkway, Va.	1,896	14,671	324	-	-	1,896	14,671	324	1,896	14,671	324
Great Smoky Mts. N.C.	-	-	-	7,520	289	556	7,520	289	556	7,520	289
Shenandoah Va.	40	158	9	30,239	697	845	30,239	697	885	30,597	700
TOTALS	1,936	14,829	333	1,401	37,759	986	3,337	986	3,337	52,538	1,319

Wild and cultivated ribes

TABLE #14A SHEET #43
SUMMARY OF RIBES ERADICATION ON NATIONAL PARKS 1918 - 1945 (INCLUSIVE)

NATIONAL PARKS	NET CONTROL AREA			INITIAL ERADICATION WORK			
	Acreage of White Pine in Net Control	Total Acreage (W.p. & Prot. Zones)	Acreage Not yet Worked Initially	Gross Acreage Reported Initially	Net Acreage Worked in Control Area	Gross Wild & Cultivated Ribes Destroyed	Gross 8-Hour Man-days
Blue Ridge Pkway, N.C.	1,630	4,312	-	4,312	4,312	61	-
Blue Ridge Pkway, Va.	455	1,896	-	1,896	1,896	14,881	324
Blue Ridge Pkway (Both)	2,085	6,208	-	6,208	6,208	14,942	333
Great Smoky Mts. N.C.	10,379	21,627	-	21,627	21,627	81,103	1,535
Great Smoky Mts. Tenn.	45,525	76,708	-	76,708	76,708	137	471
Great Smoky Mts. (Both)	55,904	98,335	-	98,335	98,335	81,240	2,006
Shenandoah - Va.	15,590	26,967	-	26,967	26,967	1,059,816	12,995
TOTALS	73,579	131,510	-	131,510	131,510	1,755,998	15,331

TABLE #4A, SHEET #4

SUMMARY OF RIBES ERADICATION ON NATIONAL PARKS 1918 - 1943 (INCLUSIVE)

	REERADICATION WORK					TOTALS	
	Gross Acreage Reported	Net Acreage Re-Worked in Control Area	Gross Number Wild & Cultivated Ribes Destroyed	Gross Number 8-Hour Man-Days	Gross Initial and Re-Worked Acreage Reported		
NATIONAL PARKS							
Blue Ridge Pkway, N.C.	85	85	-	1	4,397		
Blue Ridge Pkway, Va.	-	-	-	-	1,896		
Blue Ridge (Total)	85	85	-	1	6,293		
Gr. Smoky Mts. N. C.	9,215	274	24,206	642	30,842		
Gr. Smoky Mts. Tenn.	1,825	-	-	-	78,533		
Gr. Smoky Mts. (Total)	11,040	274	24,206	642	109,375		
Shenandoah - Va.	17,891	2,891	831,656	10,934	44,858		
TOTALS - NAT. PARKS	29,016	3,165	855,862	11,577	160,526		

	TOTALS (Initial & Re-Work)					TOTALS	
	Net Acreage Initial and Re-Work	Initial	Re-Work	Other Reworkings	Gross Number Wild & Cultivated Ribes Destroyed	Gross Number 8-Hour Man-Days	
NATIONAL PARKS							
Blue Ridge Pkway, N.C.	85	4,312	85	-	61	10	
Blue Ridge Pkway, Va.	-	1,896	-	-	14,881	324	
Blue Ridge (Total)	85	6,208	85	-	14,942	334	
Gr. Smoky Mts. N. C.	909	21,627	274	274	105,309	2,177	
Gr. Smoky Mts. Tenn.	1,825	76,708	-	-	137	471	
Gr. Smoky Mts. (Total)	2,734	98,335	274	274	105,446	2,648	
Shenandoah - Va.	15,000	26,967	2,891	2,891	2,491,472	23,922	
TOTALS - NAT. PARKS	17,819	131,510	3,165	3,165	2,611,860	26,911	

TABLE #1 SHEET #1
BLISTER RUST CONTROL ON NATIONAL PARKS IN THE SOUTHERN APPALACHIAN STATES
ACREAGE DATA 1943 and 1948 - 1943 INCL.
BY AGENCIES (1)

NAME OF PARK	STATE	Gross Acres Control Area	Period Indicator Year	ACREAGE WORKED BY PARK SERVICE			Totals
				First Working	Second Working	Subsequent Working	
Blue Ridge Parkway	N. C.	4,312 (2)	1943	-	-	-	1,899
Blue Ridge Parkway	Va.	1,896	"	-	-	-	336
Great Smoky Mts.	N. C.	21,627	"	-	-	-	220
Great Smoky Mts.	Tenn.	76,708	"	-	-	-	845
Shenandoah	Va.	26,967	"	40	-	-	1,065
Totals		131,510		1,035	336	1,065	3,537

1943 - 1943 INCL.

Blue Ridge Parkway	N. C.	4,312		1,899	-	-	1,899
Blue Ridge Parkway	Va.	1,896		336	-	-	336
Great Smoky Mts.	N. C.	21,627		-	-	-	-
Great Smoky Mts.	Tenn.	76,708		-	-	-	-
Shenandoah	Va.	26,967		40	-	-	40
Totals		131,510		1,035	336	1,065	3,537

- (1) Some adjustments have been made in the Bureau and Field Agency Totals to agree with Cumulative Tables 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
- (2) Some areas have not been surveyed, hence omitted from the above.

REPORT ON THE CONTROL WORK PERFORMED ON NATIONAL PARKS (CONTINUED)

1945

ACREAGE WORKED BY BUREAU

ACREAGE WORKED BY BOTH AGENCIES

NAME
OF
PARK

STAFF

First
Working

Second
Working

Subsequent
Working

Total

First
Working

Second
Working

Subsequent
Working

Total

Blue Ridge Parkway

N. C.

-

-

-

-

-

-

-

-

0

Blue Ridge Parkway

Va.

-

-

-

-

1,896

-

-

1,896

0

Great Smoky Mts.

N. C.

-

-

-

-

-

556

220

556

0

Great Smoky Mts.

Tenn.

-

-

-

-

-

-

-

-

0

Shenandoah

Va.

-

-

-

-

40

-

845

885

0

Totals

-

-

-

-

1,936

556

3,065

3,557

-

0

1945 - 1947 inclusive

Blue Ridge Parkway

N. C.

4,312

85

-

-

4,397

4,312

-

4,397

0

Blue Ridge Parkway

Va.

-

-

-

-

1,896

-

-

1,896

0

Great Smoky Mts.

N. C.

18,501

8,556

54

26,911

21,527

6,941

274

30,642

0

Great Smoky Mts.

Tenn.

74,885

1,825

-

76,708

76,708

1,825

-

78,553

0

Shenandoah

Va.

1,417

11,696

614

13,727

26,967

15,000

2,891

44,858

0

Totals

98,916

22,152

668

121,743

151,510*

25,851*

5,165*

160,526

0

*These gross acreage figures agree with Omnibus Tables 1A, Sheets 3 & 4.

Local Control in 1943

No eradication was carried on in 1943 in the Qualla or Cherokee Indian Reservation, which is located in Cherokee, Graham, Jackson and Swain Counties in extreme western North Carolina. A recheck of the records showed that there were 22 acres of white pine in the reservation, an increase of 5 acres over 17 acres reported last year, the new pine being found in Cherokee County Pine Area No. 45. The total control area was also raised 100 acres, making the control acreage today 445 acres. This has all been given initial protection. No ribs have been found near the pine which is being protected. Labor used - 1 man-day. No reworking has been carried on.

TABLE SHOWING LOCATION OF PINE ON RESERVATION

County	Control Acreage	White Pine Acreage		Total
		Native	Planted	
Cherokee	100	5	0	5
Swain	345	5	12	17
Total	445	10	12	22

SUMMARY OF WORK ON INDIAN RESERVATIONS 1913 - 1943 INCL.

No work in 1943

SUMMARY OF WORK ON INDIAN RESERVATIONS 1913 - 1943 INCL.

Indian Reservation	Acreage of White Pine in Net Control Area	Net Control Area Total Acreage (W.p. & prot. Zones)	Acreage not yet Worked Initially
Qualla in N. C.	22	445	

Initial Eradication Work

Gross Acreage Reported Initially Worked	Net Acreage Worked in Control Area	Gross Number Wild and Cultivated Ribes Destroyed	Gross Number 8-hour Man-Days
445	445		1

Reeradication Work

Gross Acreage Reported Re-Worked	Net Acreage Re-Worked in Control Area	Gross Number Wild & Cultivated Ribes Destroyed	Gross Number 8-Hour Man-Days
	1st Others		

Totals (Initial & Re-Work)

Gross Initial and Re-Worked Acreage Reported	Net Acreage Initial and Re-Work	Gross Number Wild & Cultivated Ribes Destroyed	Gross Number 8-Hour Man-Days
445	445		1

SECTION 7 - MISCELLANEOUS

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	Bureau Expenditures			Proration		
States	Expenditures	Proration	Total	Proration	Total	
	Other Than	Proration	Total	Proration	Total	
	Forest Service	to States	Proration	Forest	Proration	
7/1-12/31/43						
Georgia	\$1818.67	\$2,056.37	\$3,875.04	Chattahoochee	\$2,100.01	
North Carolina	1519.92	2,056.37	3,576.29	Piedmont	2,230.45	
Tennessee	1628.02	2,056.37	3,684.39	Cherokee	4,421.36	
Virginia	2755.21	2,056.38	4,811.59	Jefferson	4,862.46	
West Virginia	1998.73	2,056.37	4,055.10	Geo. Wash.	5,794.05	
				Geo. Wash.	6,062.63	
				Monongahela	6,083.53	
Totals	\$9720.55	\$10,281.86	\$20,002.41		\$38,651.31	

Regular Funds 3101.14 (BE & PG)

Expenditures in 1943

State	Period	Period	Column
	7/1/43 - 6/30/43	7/1-12/31/43	Year 1943
	Expend. including Richmond Office Proration	Expend. including Richmond Office Prorations	
Georgia	\$3,143.19	\$3,875.04	\$7,318.23
Maryland	776.58	-	776.58
North Carolina	3,504.82	3,576.29	7,081.11
Tennessee	4,704.80	3,684.39	8,389.19
Virginia	6,583.05	4,811.59	11,394.64
West Virginia	5,806.52	4,055.10	9,861.62
Totals	\$24,818.96	\$20,002.41	\$44,821.37

States	1/1-6/30 1943	7/1-12/31 1943	Total for Calendar Year.
Delaware	-	\$52.63	\$52.63
Georgia	\$1,330.45	82.12	\$1,412.57
Maryland	-	38.10	38.10
North Carolina	3,344.16	2,199.88	5,544.04
Tennessee	1,796.69	1,635.36	3,432.05* (plus \$409.55 WPA = \$3841.60)
Virginia	1,556.81	112.73	1,699.54
West Virginia	3,104.96	1,647.03	4,751.99
Totals	\$11,133.07	\$5,797.85	\$16,930.92

*In Table 5, Sheet 2 the WPA expenditure of \$409.50 has been added = \$3,841.60.

Regular Funds 3101.14 (Forest Service) Expended
Calendar Year 1943

State	Forest	Period 1/1-6/30/43	7/1-12/31/43	1/1-12/31/43
Georgia	Chattahoochee	\$5,583.09	\$5,191.81	\$10,774.90
North Carolina	Pisgah	1,044.09	2,230.46	3,274.55
Tennessee	Cherokee	4,433.25	4,421.36	8,854.61
Virginia	Geo. Washington	10,009.09	9,799.06	19,808.15
Virginia	Jefferson	2,112.42	4,862.46	6,974.88
West Virginia	Monongahela	5,444.73	6,083.53	11,528.26
West Virginia	Geo. Wash.	-	6,062.63	6,062.63
Totals		\$28,626.67	\$38,651.31	\$67,277.98

Summary for Fiscal Year 1943

State	Forest	7/1-12/31/42	1/1-6/30/43	7/1/42 - 6/30/43
Virginia	Geo. Washington	\$9,471.91	\$10,009.09	\$19,481.00 (2)

(2) This figure checks with Richmond bookkeeping sheets.

SUMMARY OF EXPENDITURES FROM
REGULAR FUNDS 3101-14 (BUREAU OF ENT. & PLANT QUARANTINE)
IN 1942 AND 1943

State	Amount Expended in States Includ- ing Prorations of Richmond Office Exp. :(7/1-12/31/42):	Richmond Office Expenditures Prorated 7/1-12/31/42	Expenditures Minus Proration 7/1-12/31/42	Expenditures Minus Proration 1/1-6/30/43
Georgia	\$1,936.81	\$1,750.48	\$186.33	\$1,465.95
Maryland	7.80	-	-	474.52
North Carolina	3,828.19	1,750.48	2,077.71	1,527.57
Tennessee	2,938.48	1,750.48	1,188.00	2,727.55
Virginia	4,286.46	1,750.48	2,535.98	4,605.79
West Virginia	4,415.48	1,750.47	2,665.01	3,829.23
Total	\$17,413.22	\$8,752.39	\$8,653.03	\$14,630.61

REGULAR FUNDS 3101-14
Bureau of Entomology & Plant Quarantine

State	Total Expenditures Minus Proration for Fiscal Yr. 1943 7/1/42-6/30/43	Richmond Office Expenditures Prorated for Fiscal Year 7/1/42-6/30/43	Total Exp. Including Prorations For Fiscal Yr. 7/42-6/30/43	Richmond Office Expenditures cluding Prorated 1/1-6/30/43	Expendi- tures Ex- cluding Proration 1/1-6/30/43
Georgia	\$1,652.28	\$3,727.72	\$5,380.00	\$1,977.24	\$1,465.95
Maryland	482.32	302.06	784.38	302.06	482.32
North Carolina	3,605.28	3,727.73	7,333.01	1,977.25	1,527.57
Tennessee	3,915.55	3,727.73	7,643.28	1,977.25	2,727.55
Virginia	7,141.77	3,727.74	10,869.51	1,977.26	4,605.79
West Virginia	6,494.24	3,727.76	10,222.00	1,977.29	3,829.23
Total	\$23,291.14	\$18,940.74	\$42,232.18	\$10,188.35	\$14,630.61
Richmond Office Expenditure	\$18,940.74	-	-	-	-
GRAND TOTAL	\$42,232.18	-	-	-	-

ANNUAL REPORT OF THE
REGULAR FUNDS 3103-11
Fiscal Year - 1943

State	Whole Fiscal Year 7/1/42-6/30/43	Period 7/1/42 - 12/31/42	Period 1/1/43 - 6/30/43
Delaware			
Georgia	\$5,034.50	\$3,704.05	\$1,330.45
Maryland			
North Carolina	4,806.73	1,462.57	3,344.16
Tennessee	1,796.69		1,796.69
Virginia	1,673.61	116.80	1,556.81
West Virginia	4,999.15	1,894.19	3,104.96
Totals	\$18,310.68	\$7,177.61	\$11,133.07

Other financial records may be found in the Omnibus Tables 5, Sheets 1 and 2 for calendar year 1943, and 6A, Sheets 1 and 2 for all years 1918 - 1943 inclusive.

EXPENDITURES OF THE REGIONAL OFFICE AT
RICHMOND, VIRGINIA AND AMOUNTS CHARGED
TO VIRGINIA*

REGIONAL OFFICE						
Period	Regular Approp.	Adm. Funds	Va. W. P. A.	N. Y. A.	Totals	Charged to Virginia
1935 - 41 ⁽¹⁾	\$42,314.88	\$20,200.44	\$20,272.58	\$531.69	\$83,319.59	\$83,319.59
1942	14,394.28 ⁽²⁾	2,019.10	-	-	16,413.38	(6,359.29
1943	18,940.74 ⁽³⁾	-	-	-	18,940.74	(1,569.96
1944	10,281.86	-	-	-	10,281.86	3,727.74
First half						2,056.37
TOTALS	\$85,931.76	\$22,219.54	\$20,272.58	\$531.69	\$128,955.57	\$97,032.95

(1) A breakdown of these figures is to be found in my Annual Report for 1940, page C-10.

(2) In Fiscal Year 1942, of \$14,394.28, \$6,359.29 expended from July 1 to December 31, 1941 was charged to Virginia, as in previous years, while \$8,033.63 expended from January 1 to June 30, 1942 was prorated among six states, of which \$1,569.26 was charged to Virginia.

(3) The regular expenditures for Fiscal Year 1943 were divided as follows:
1st half year - \$8,752.39; 2nd half year - \$10,188.35.

* Note: The policy throughout the country up to December 31, 1941 was to charge to the State in which the regional office was situated all of the expenditures of the regional office. From January 1, 1942, regional office expenditures were prorated among the several states.

LOCATION OF BLISTER RUST CONTROL WORK IN 1943
By State, Project, Activity and County

Georgia - Regular project

Local Control* - Gilmer, Lumpkin and Murray Counties

Other Activities** - Dawson, Fannin, Gilmer, Lumpkin, Murray and Union Counties

Office - Lumpkin

Maryland - Regular project

Local Control - Garrett County

Other Activities - Allegany and Garrett Counties

* Local control includes checking and ribes eradication.

** Other activities include only surveys unless other types of work are shown.

Delaware - Regular project

Local control* - New Castle

Other activities** - New Castle

North Carolina - Regular project

Local control - Haywood, Mitchell, Madison and Yancey Counties

Other Activities - Avery, Buncombe, Madison, Mitchell, Watauga and Yancey Counties
(Field Studies)

Office - Buncombe and Watauga Counties

C. P. S. Project

Local Control - Haywood County

Tennessee - Regular project

Local control - Carter, Johnson, Monroe and Polk Counties

Other activities - Monroe and Polk Counties Office - Knox County

Virginia - Regular project

Local control - Alleghany, Augusta, Botetourt, Carroll, Floyd, Franklin,
Highland, Patrick, Rockbridge and Rockingham Counties

Other activities - Augusta, Bath, Grayson, Rockbridge and Rockingham Counties

Office - Rockingham

C. P. S. Project

Local Control - Albemarle, Amherst, Greene, Madison, Nelson, Page, Rappahannock,
Rockbridge, and Rockingham

Canker elimination - Madison, Page and Rappahannock Counties

West Virginia - Regular project

Local control - Pendleton, Pocahontas and Tucker Counties

Other activities - Greenbrier, Pendleton, Pocahontas and Tucker Counties

Nursery sanitation - Tucker County

Canker elimination - Pocahontas

Office - Pocahontas and Pendleton Counties

* Local control includes checking and ribes eradication.

** Other activities include only surveys unless other types of work are shown.

Personnel Accidents

In the calendar year 1943 there were no personnel accidents reported to this office or sent to the U. S. Compensation Commission. In 1942, there were but three accident cases reported to the U. S. Compensation Commission.

Truck and Auto Accidents

During the calendar year 1943, there were four cases of collision between government-owned trucks and other motor vehicles. Two of them one in North Carolina and one in Tennessee were very minor accidents and the cases were closed after reporting them.

Of the other two, one in Tennessee was a minor accident caused by a collision of a government-owned truck with a Chevrolet sedan owned by Gordon Russell of Elizabethton, Tennessee, on February 27. The government driver was at fault in this case. The Solicitor's Office informed the Bureau that a claim of \$6.00 for damages, made by Mr. Russell, was approved for payment by the Secretary of Agriculture on June 1, 1943.

In Virginia, a government-owned automobile was run into by a truck owned by Fred Cochran of Winchester. In this case, the driver of the privately-owned truck was at fault. The case with claim for \$46.50 against Fred Cochran was forwarded by the Solicitor of the Department to the Attorney-General for prosecution, if in his opinion the facts warranted such action.

Transportation

There were on hand January 1, 1943, 40 trucks including one station wagon and 3 passenger cars, making a total of 43 vehicles. At the end of the year 1943, there were on hand 42 trucks and 3 passenger cars, making a total of 45 vehicles. During 1943, 8 trucks were sold by Board of Survey and one was transferred to the Office of Emergency Management. To replace those sold and others being worn out, we received as a temporary loan from the Barberry Eradication Office, 12 trucks.

Of the trucks on hand January 1, 1944, 11 were of 1935 model, 4 were '36, 1 was '38, 18 were '39, 3 were '40 and 5 were '41. In other words, 15 of the trucks are either 8 or 9 years old.

Steps should be taken within the next year if possible to secure trucks not over three or four years old to replace the eight and nine year old trucks, which for the most part have a high mileage running from 53,000 to 75,500. These old trucks are becoming costly to operate, requiring frequent repair and they have deteriorated to a point where their safe operation is questionable.

Passenger Cars and Trucks Used in
Southern Appalachian States in
Calendar Year 1943

Passenger Cars

Present License Number	Serial Number	Engine Number	Make	Tonnage	Year Model	State	Speedometer Reading 12-31-43
A5-328	14FC-0214326	M59034-1-9	Chevrolet Sedan	5 Pass.	1936	Va.	101,430
A5-362	P6EB40673	6595278	Pontiac "	" "	1939	Va.	60,961
A5-363	18-5315287	18-5315287	Ford 2-door"	" "	1940	W.Va.	59,179

Trucks

A5-326	8628265	PT81-22597	Plym. Pickup	1 1/2	1939	Va.	26,045
A5-327	5JC059730	K24-88381	Chevrolet "	1 1/2	1939	Ga.	51,062
A5-329*	8072312	T12-24165	Dodge Pickup	1 1/2	1935	Ga.	Sold in '43
A5-330	5JC059788	K19-23655	Chev. "	1 1/2	1939	N. C.	28,696
A5-331	8072243	T12-25986	Dodge "	1 1/2	1935	Va.	53,642
A5-332	8628190	PT81-22350	Plym. "	1 1/2	1939	N. C.	38,709
A5-335	8072247	T12-26243	Dodge "	1 1/2	1935	Tenn.	75,469
A5-336	8072366	T12-25435	Dodge "	1 1/2	1935	Va.	53,211
A5-338	8288877	T74-6519	Dodge Stakebody	1 1/2	1939	W.Va.	47,178
A5-339	8288936	T74-6773	Dodge "	1 1/2	1939	Va.	30,983
A5-340	8072377	T12-25805	Dodge Pickup	1 1/2	1935	Tenn.	65,279
A5-341	8288875	T74-6596	Dodge Stakebody	1 1/2	1939	Va.	44,643
A5-342**	8FD012777	K57-42052	Chev. Pickup	1 1/2	1936	Tenn.	Transferred O. E. M.
A5-343	8628076	PT81-21922	Plym. "	1 1/2	1939	N. C.	31,951
A5-344*	8072448	T12-25885	Dodge "	1 1/2	1935	Va.	Sold in '43
A5-345	8628117	PT81-22118	Plym. "	1 1/2	1939	Tenn.	38,610
A5-346	8288927	T74-6464	Dodge Stakebody	1 1/2	1939	Tenn.	41,752
A5-347*	8072248	T12-25423	Dodge Pickup	1 1/2	1935	Va.	Sold in '43
A5-348*	8072406	T12-26758	Dodge "	1 1/2	1935	Va.	Sold in '43
A5-349	8072320	T12-24610	Dodge "	1 1/2	1935	Va.	72,946
A5-350	8628097	PT81-21907	Plym. "	1 1/2	1939	Va.	49,492
A5-351	8072492	T12-22400	Dodge "	1 1/2	1935	Va.	55,100
A5-352	8072368	T12-25318	Dodge "	1 1/2	1935	Va.	Sold in '43
A5-353	8072429	T12-24472	Dodge "	1 1/2	1935	Va.	66,006
A5-354	8072389	T12-26496	Dodge "	1 1/2	1935	Va.	67,207
A5-355	8628118	PT81-22136	Plym. "	1 1/2	1939	Va.	28,365
A5-356	8288935	T74-6770	Dodge Stakebody	1 1/2	1939	Va.	38,663
A5-357*	8072404	T12-25119	Dodge Pickup	1 1/2	1935	Ga.	Sold in '43
A5-358	8628275	PT81-22382	Plym. "	1 1/2	1939	Va.	34
A5-359	21TB02-4371	T16-92275	Chev. Stakebody	1 1/2	1938	Va.	38,293
A5-360	2FC-116592	M5745638	Chev. Delivery	1 1/2	1936	Va.	81,936
A5-361*	8072424	T12-24697	Dodge Pickup	1 1/2	1935	Va.	Sold in '43
A5-364	8628082	PT81-21923	Plym. "	1 1/2	1939	W.Va.	21,167

* Sold in 1943

** Transferred in 1943

Transportation (Continued)

Present							Speedometer
License Number	Serial Number	Engine Number	Make	Ton-nage	Year Model	State	Reading 12-31-48
A5-365	2FC116661	M57-45721	Chev. Delivery	$\frac{1}{2}$	1936	W.Va.	70,580
A5-366	-	Number changed to A5-369		-	-	-	-
A5-367	8072379	T12-25465	Dodge Pickup	$\frac{1}{2}$	1935	W.Va.	53,122
A5-368	8072365	T12-24492	Dodge "	$\frac{1}{2}$	1935	W.Va.	36,902
A5-369	2FC-116302	M57-28144	Chev. Delivery	$\frac{1}{2}$	1936	W.Va.	83,192
A5-370*	8072326	T12-25413	Dodge Pickup	$\frac{1}{2}$	1935	Va.	Sold in 1943
A5-371	2FC-116793	M57-52877	Chev. Delivery	$\frac{1}{2}$	1936	Va.	62,814
A4-813	14JC-067129	K26-02208	Chev. Pickup	$\frac{1}{2}$	1939	Va.	55,400
A4-814	14KB03-8641	3279973	Chev. Sedan Del.	$\frac{1}{2}$	1940	Va.	83,989
A4-815	14KB03-8640	3279991	" " " "	$\frac{1}{2}$	1940	Tenn.	75,593
A4-818	18-5900476	18-5900476	Ford Panel Del.	$\frac{1}{2}$	1941	Ga.	51,582
A4-819	18-5950089	18-5950089	" " " "	$\frac{1}{2}$	1941	Va.	39,326
A4-820	18-6611725	18-6611725	" " " "	$\frac{1}{2}$	1941	Va.	30,974
A4-832	8535848	T81-25541	Dodge Pickup	$\frac{1}{2}$	1939	W.Va.	29,414
A4-836	14YR06-13726	AF904538	Chev. Stakebody	$\frac{1}{2}$	1935	W.Va.	9,046
A4-921	14AK05-10968	AD-913426	Chev. Pickup	$\frac{1}{2}$	1941	Va.	27,167
A4-923	14YR0512902	AF871849	Chev. Stakebody	$\frac{1}{2}$	1941	Va.	9,900
A4-926	14KC03-6508	K32-34742	Chev. Pickup	$\frac{1}{2}$	1940	Ga.	37,333
A4-927	D-2-213	H21-369611	International canopy top	$\frac{3}{4}$	1939	Va.	21,378

*Sold in 1943

**Transferred in 1943

Informational Activities - 1943

The usual informational work was carried on by the State Leaders and Agents. The following table shows the character and extent of this work.

Activity	Del.	Ga.	N.C.	Tenn.	Va.	W. Va.	Totals
Exhibits placed		2	1			1	4
Individuals Instructed			499	53	261	90	903
Interviews	93		110		293	73	569
Items Published			12	7	2	6	27
Meetings held			16	10	17	19	62
Meetings, Attendance at			4,296	758	1,607	2,020	8,681
Posters placed		3			11	1	15
Publications Distributed	197	4	1,726	97	1,054	212	3,290
Moving Pictures shown ⁽¹⁾			29	11	13	17	70

(1) These may not all be in addition to meetings held.

The eastern blister rust sound film and the Georgia film have both been used to great advantage, seventy showings being made during 1943. The films are probably responsible for the increased attendance at meetings. In 1943, 8,681 attended meetings while in 1942 only 4,967 attended meetings.

The Girl Scouts attending Camp May Flather on North River in Augusta County, Virginia have for seven years assisted in ribes eradication near their camp on the George Washington National Forest. Seven educational trips were taken with these Scouts showing them various phases of the rust on ribes and pine, also motion pictures of the blister rust and national forest work. A total of 138 different girls working approximately two hours per day found and destroyed 781 wild gooseberries on approximately 110 acres.

In West Virginia a blister rust control exhibit was placed at the Pocahontas County Fair, one of the few county fairs held in the State in 1943. Blister rust control work in the State was Briefly reviewed on the West Virginia Radio Network October 18. The story originated from a write up issued by the Associated Press, through the Conservation Commission. The summary over the radio was concise and well put.

Publication of Results and Findings - Reports

The Annual Report on White Pine Blister Rust Control, Southern Appalachian States for the calendar year 1942 was written by Roy G. Pierce with the assistance of J. Curtis Ball and State leaders - June 7, 1943.

Annual Reports for 1942 were prepared by the State leaders of Georgia, Maryland, North Carolina, Tennessee, Virginia and West Virginia and were submitted to the Richmond and Washington Offices early in 1943.

Publications of Results and Findings - Reports (Continued)

The Ribes Ecology Seminars, a series of short papers, begun in July 1941, were continued in 1943, 8 of them Nos. 25 to 32 being put out.

The following articles concerning blister rust control in the Southern Appalachian States were printed or put out in duplicated form.

Pierce, Roy, Walter A. Stegall, et al - Notes on the Regeneration of the Georgia Gooseberry (*Ribes curvatum* Small) in Tennessee and Georgia. Technical Memorandum No. 9, October 14, 1943, 7 pages, Richmond, Va.

Pierce, Roy G. Ralph W. Welch and George C. Hamilton. An Analysis of Ribes Eradication on One Hundred and Six Areas in Pendleton County, West Virginia, Which Have Been Worked Twice, the Last Working Taking Place in 1940, 1941 or 1942. Technical Memorandum No. 5, April 5, 1943, 18 pages, Richmond, Virginia.

Pierce, Roy G. and H. E. Yost. Field Studies on 1. Effectiveness of Chemicals on Decapitated and Non-Decapitated Ribes. 2. Pine Infections, and 3. Ribes Regeneration in Tennessee. Technical Memorandum No. 8, June 7, 1943, 9 pages, Richmond, Virginia.

Temple, C. E. and H. E. Yost. White Pine Blister Rust Control in Maryland. University of Maryland, Extension Service, State Horticultural Department. Bulletin No. 98. June 1943, 23 pages, illus. College Park, Maryland.

Welch, Ralph W. A Canker Elimination Project in the Seneca State Forest, West Virginia. Technical Memorandum No. 7, May 1, 1943, 9 pages, Richmond, Virginia.

Welch, Ralph W. Evidence of the Infecting Power of Cultivated Ribes as Observed on Thomas Creek in Pocahontas County, West Virginia. Technical Memorandum No. 6. February 4, 1943, 3 pages, Richmond, Virginia.

Welch, Ralph W. Anonymous article on Progress is Made in Conquering Pine Disease. West Virginia Conservation, Vol. 7, No. 8, pages 8, 20, 21. November 1943, Charleston, West Virginia.

Welch, Ralph W. Mouse Versus Blister Rust. Typed mss, 2 pages, June 1, 1943. Marlinton, West Virginia.

Cooperation in Fire-Fighting

The Division has cooperated closely in 1943 with the U. S. Forest Service in fire-fighting. While the past year has not been one of the worst fire years, there have been quite a number of fires in the two Forest Service Regions 7 and 8 for which our men have been called out for assistance in suppressing them.

The following notes concerning our fire-fighting activities have been culled from the records.

Cooperation in Fire-Fighting (Continued)

A blister rust control crew of three men was taken by Forest Ranger Johnson of the Chattahoochee National Forest in Georgia into Walker County to fight forest fire in the week ending February 20, 1943. They were used by the Forest Service for a total of 19 hours.

The crew fought fire on April 6 on Fort Mountain State Park in Murray County. In Polk County, Tennessee, the Sheeds Creek crew of 13 men, after a full day's work on blister rust control, went out and fought fire for 13 hours on March 30, while early in April the same crew fought several fires also in the Cherokee National Forest. In North Carolina, State leader H. B. Teague on one field trip saw two fires which had started only that day. The first being a large fire was reported to the proper authorities, while the second, which was smaller, was put out by Mr. Teague with the aid of three local men whom he secured. In the Jefferson National Forest in Virginia, one of our crews was retained for many days by the fire warden during hazardous dry weather to fight fires should they arise. In the George Washington National Forest, blister rust crews were engaged during the worst fire season in the spring of 1943 in fire suppression. A foreman, Bud Huffer, was also lent to the Forest Service for directing fire control work on the Pedlar District. On one large fire in the Deerfield District, Agent George C. Cramer spent about two days in charge of the camp which was established near the site of the fire.

On November 1, seven of the Mitchell County, North Carolina blister rust crew members together with the foreman fought forest fire on the Pisgah National Forest in the Hughes Branch area of Mitchell County. The men spent 73 hours on the work. On November 18, 19 and 20, blister rust control crews working in Augusta and Rockingham Counties aggregated about 300 man hours in fire-fighting on the George Washington National Forest. In Georgia, during the week ending November 27, the blister rust control crew on the Chattahoochee National Forest was called out by Ranger Lethco and the men put in 170 hours fighting fires on the forest. In all the records show that from September 15 through December 15 at least 543 hours were spent on fire-fighting by our blister rust control crews in the Southern Appalachian States.

Agent Hamilton of Pendleton County, West Virginia reported that on the evening of November 26, 1943 five of his men located at Brandywine were called by a local fire warden to fight fire on the George Washington National Forest on Narrow Back Mountain in Augusta County, Virginia. The fire was 7 to 10 acres in extent. The men were paid from 6:00 p. m. on November 26 to 3:00 a. m. on the 27th, nine hours for each man, or a total of 45 hours for the crew. The Forest Service furnished transportation and of course paid the men for their time. It is understood that the fire was fought successfully.

It might be thought on a glance at the figures of acreage worked in 1941, ribes pulled and man-hours labor employed on survey and eradication that the war had not affected the work much. However, when a comparison of the work from 1937 to 1941 inclusive, is made with that of the next two calendar years, 1942 and 1943 (see accompanying table and graph) it is quickly recognized that there has been much less man days labor used with less acreage covered and fewer bushes pulled.

The Effect on Funds:

The first result of the war was the dropping of the Emergency Funds available for control work. The WPA ceased operations as did the C. C. C. In a small way, one emergency project, the C. P. S. or conscientious objectors, was caused by the war and this project has offset in the three national parks the loss of C. C. C. The loss of Emergency funds has been met in part by an increase in Federal Regular funds which were increased from \$17,578 in 1941 to \$49,747 in 1942, and to \$130,749 in 1943.

The Effect on Fiscal Administration:

Fiscal work in the region has been increased considerably since the beginning of the war, due to the various programs which have become an integral part of the payrolls. Particular reference is made to the Payroll Deduction Plan for the purchase of war bonds and deductions of income and victory taxes. The detail is not confined entirely to the payroll but also to numerous reports required by various agencies in connection with bond purchases and reports to workers as well as the Bureau of Internal Revenue with regard to tax deductions.

All fiscal matters in connection with blister rust control on the national forests are handled through our regional office. This work requires a great deal of time for preparation of vouchers, payrolls, purchase orders, etc., for which we are later reimbursed by the Forest Service. The handling of funds for blister rust control on the national forests was not a part of our program prior to the war.

The Effect on Personnel:

Lessened funds have necessitated a much smaller labor force. Work in Tennessee, North Carolina and Georgia was however being curtailed before 1942, hence lessened personnel in those states cannot be entirely attributed to the war. In Maryland, however, the closing of the cooperative project is a direct result of the war, the State Entomologist and Pathologist affirming that the project will be continued after the war.

The increase in wages because of overtime compensation has decreased the man-days labor which can be secured with a given amount of money by from 16.3 to 20 percent.

As to the class and age of labor for surveying and eradication, because of the war, we have had recourse to boys under 18 and to older men. An analysis of age of 132 laborers in the four States of Georgia, Tennessee, Virginia and West Virginia shows the number in each ten year age-group.

Number of Laborers in Blister Rust Control in July and August 1943 in Four States,
According to Age.

: State	15 to 19	20 to 29	30 to 39	40 to 49	50 to 51	60 or over	:
: Georgia	4		4				:
: Tennessee	10	9	7	4	6	1	:
: Virginia	19	5	9	6	7	1	:
: West Virginia	9	6	9	5	9	3	:
: Total	42 (1)	20	29	15	22	5	:
: Percent in							:
: each group	32	15	22	11	16	4	:

(1) Of this youngest age-group 30 were 15, 16 or 17 years of age; that is below the Selective Service draft age.

Two Tennessee agents, J. W. Lane and W. A. Stegall, Jr., who were well trained and had been in the force several years, left our employ, the first to go into war work, the second to be drafted into the Army. Other agents will shortly be inducted into the Armed Forces. Some of the agents now in our employ have not the education and training that is considered most desirable. They have made up for this in their willingness to endure hardships, coincident with working outside in all kinds of weather over the roughest of terrain, in their ability to handle men and in their willingness to learn.

One stenographer, Mrs. Minnie C. Hudgins, with 6-3/4 years' service as Clerk-Stenographer in the regional office was furloughed to join the WAAC.

As a direct result of the war, the services of Mr. H. K. Cooper, Jr. Administrative Assistant in the Richmond office were lost on May 24, 1943 on account of his furlough to the War Department.

The labor situation in this region has not been a serious one despite the fact that many of our best trained men have gone to the Army or Navy. We have not needed many men from any one county. Hence, working back in the mountains, we have been able to recruit a number of men who are either farmers or work part-time on the farms, letting them off from our work when they pleased to do their necessary planting, cultivating and harvesting or haying. This part-time employment has given us men and given the men a paying job when they weren't farming and has met the approval of local labor boards.

With the rapid labor turnover caused by induction into the Armed Services or by the men securing better paid jobs in war industries, we have had to be constantly training men for new jobs, breaking men in as sub-foremen and foremen, and gradually moving the foremen up to field supervisors. All but one of the six present field supervisors have risen from the ranks of foremen and two of the State leaders were formerly district agents, (now called field supervisors).

The Effect on Transportation:

Transportation was drastically cut, the use of the messenger cars by the Richmond Office personnel was lessened because of regulations growing out of the shortage of rubber and gasoline, and public carriers have had to be used whenever possible and this has frequently been at the inconvenience of the traveler. Because of closing of garages and the increased business of those remaining open, repairs have not been made as promptly as before the war. In other words government business, paid for by check, is not wanted by some garage owners who have all the business they want.

Tires have been used longer than was customary since they could not be replaced. Recapped tires have been of poor quality. Surplus tires could not be kept for an emergency but were requisitioned by the Procurement Division of the Treasury Department. No new fire extinguishers have been available for the trucks and for a time, we could not get the old ones repaired because of too low a priority rating.

Passenger cars were "frozen", one Chevrolet Sedan being still used in this region with 101,430 miles run, and 7 trucks with from 70,000 to 83,000 miles. In order to keep the trucks in running order they have been overhauled, repaired and repainted at the garage at Bridgewater, Virginia. A number of trucks have been kept there which have been exchanged for others in the region needing overhauling or repairing.

While sufficient gasoline has been allotted the region by the Office of Defense Transportation (O. D. T.) for reasonable use, yet insufficient mileage has been allotted by the "Mileage Administration" through the Bureau to use the gasoline coupons issued by the Office of Price Administration (O. P. A.).

The Effect on Equipment and Supplies:

String, considered necessary for the best crew work in eradication, has been unavailable. Paper has been used instead to mark lanes of work. Typewriters have been "frozen" and are not procurable.

The Effect on Health:

The lengthening of hours of work because of the war from 40 to 43 per week have not been conducive to keeping the agents, clerical assistants and supervisors in the best of health.

This does not affect laborers since they are not required to work 43 hours per week.

Agency	1937	1938	1939	1940
Federal - Regular	\$5,405	\$13,331	\$9,355	\$16,671
State, County & Private Regular	28,121	32,273	22,341	14,855
Total-Regular	\$33,526	\$45,604	\$31,700	\$31,526
Federal Emergency	230,787	183,918	196,339	200,716
Total - All Funds - Federal, State, County and Private	264,313	229,522	228,039	232,242

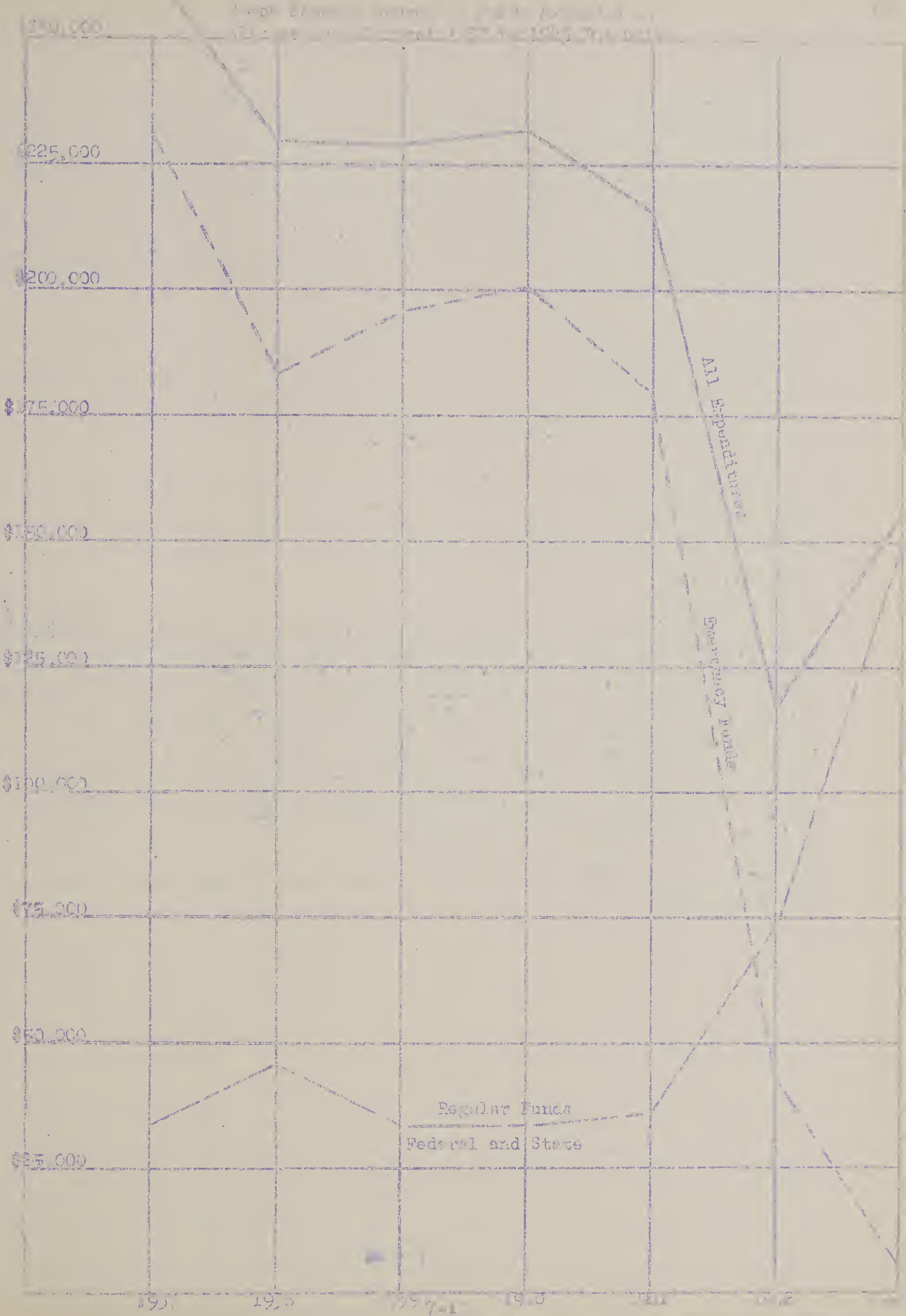
Agency	1941	1942	1943
Federal - Regular	\$17,578	\$49,745	\$130,749
State, et al - Regular	18,237	23,990	18,750
Total - Regular	\$35,815	\$73,735	\$149,499
Federal Emergency	179,434	43,564	5,572
Total - All Funds	\$215,249	\$117,299	\$155,071

* C. P. S. - Conscientious Objectors working in National Parks.

Comparison of Eradication Results in Years 1937 to 1943 Inclusive

	1937	1938	1939	1940
Total Acreage Worked	1,248,773	735,008	491,106	655,821
No. of Ribes Bushes Pul- led	5,216,119	4,750,971	3,230,851	3,106,985
Man Days Labor	48,212	40,828	34,218	23,663
	1941	1942	1943	
Total Acreage Worked	615,872	197,541	562,627	
No. of Ribes Bushes Pul- led	2,090,146	906,407	817,615	
Man Days Labor	24,923	9,238	10,191	

Total Expenditures in Region



CAMPS

Beginning in 1943, camps were operated in the Cherokee and Chattahoochee National Forests in connection with the blister rust control operations in those forests.

The Cherokee camps in Polk and later in Monroe County, Tennessee have been operated on an official basis, being supervised by the blister rust field supervisor. The cook and all items of food, bed clothing, etc., have been furnished by the Forest Service, and individuals using the facilities provided have been charged for their meals and quarters at a rate which would offset most of the expenses involved.

The Chattahoochee Camp in Georgia has been operated by the men staying at the camp. They have pooled their funds for purchase of food and miscellaneous items and have provided their own bed clothing. Quarters during the winter months was a cabin on Rock Creek furnished gratis by the Georgia Department of Wildlife. During the summer months the men lived in tents supplied by the Forest Service. The cook has been paid from Forest Service funds.

Operation of the camps has meant a great deal in overcoming transportation difficulties by keeping camp sites as near as practical to field operations. Being near to the point of operations has also permitted many more hours of actual field work because of the decrease in time consumed in travel.

SCRAP COLLECTION

In order to assist in the war effort and because of the locale in which our crews were working (that is, public timber land), a concerted effort was made to collect and turn in all of the scrap metal and rubber possible. In 1942, the crews had turned in to relief agencies, schools, Red Cross and kindred agencies, 25,582 pounds of scrap metal and 1,043 pounds of rubber. In 1943, there was collected in the Southern Appalachian States a total of 36,688 pounds of scrap metal and 1,216 pounds of rubber. In addition, the location of several thousand pounds of old railroad track, old logging cable and equipment along the Upper Tellico River in Monroe County, Tennessee were reported to the War Production Board. A field representative from Chattanooga was sent to contact Agent Garland as to the exact location of the material.

This work does not interfere with the regular pine survey and ribes eradication work carried on.

WHITE PINE

Lumber Production - Prices, Values

The following table shows that for the reporting mills in eight of the Southern Appalachian States 86,530,000 feet of white pine lumber were produced in the calendar year 1942. The average value per M. foot of lumber at the mill ranged from \$18.05 in Georgia to \$37.44 in Kentucky, the average for the region being \$26.07. White pine represented 1.09 percent of the total lumber cut in the eight reporting states, the total cut being 7,888,604,000 feet. The total value at the mill of the white pine lumber cut in the eight states of the region in 1942 was \$2,255,611.00.

Lumber Production in Southern Appalachian States and Value Per (M. Feet, B. M.)
of White Pine at Mill
Data taken from: Census of Forest Products, 1942, U. S. Department of Commerce
Bureau of the Census

State	Total Lumber Sawed	Average Value All Lumber Per M.	White Pine	Average Value W. P. Per M.	Total Value of White Pine at the Mill	White Pine % of Total Sawed
Georgia	1,971,087	\$24.54	4,537	\$18.05	81,893	0.23
Kentucky	466,404	33.91	2,199	37.44	82,331	0.47
Maryland	131,138	29.43	294	27.17	7,961	0.22
N. Carolina	1,691,536	25.70	38,625	23.85	921,206	2.28
S. Carolina	1,083,221	28.93	826	22.80	18,833	0.07
Tennessee	742,865	29.49	17,198	31.79	546,724	2.31
Virginia	1,213,897	27.35	18,374	26.45	485,992	1.51
W. Virginia	588,456	40.85	4,477	24.72	110,671	0.76
Total	7,888,604	28.14	86,530	26.07	\$2,255,611	1.09

Table prepared by:
J. Curtis Ball.

FIELD STUDIES

Ribes Sprouting from Roots.

Data have just come to light of a small test carried on in 1935 by Mr. Ralph W. Welch, then Agent in Pocahontas County, West Virginia in the sprouting of ribes from roots. While no written report was found on the test, Mr. Welch has given the following from memory:

"Four large cynosbati bushes were eradicated in June, 1935, near Dunmore. The largest primary root from each bush was removed from 2" to 6" below the crown. The length of each of the root cuttings was approximately 8". Each of these roots were placed in moist locations, horizontally, and covered with about 2 inches of earth, and observations were made from time to time to determine if the roots would sprout. Since rainfall did not occur for sometime after the experiment was begun, the plot was watered by hand from time to time. All four of the root cuttings had produced sprouts within approximately one month after the experiment was begun. I recall that the sprouts were very vigorous. I believe some of the roots produced more than one sprout, and all four produced at least one."

A similar but more extensive experiment was carried on in 1936 by Agent George C. Hamilton in Pendleton County, West Virginia. This was written up in detail in my annual report for 1937, page 124.02, and extracts from the above are here made. This study plot was laid out October 6, 1936 in a forested area on the west side of Dickenson Mountain on the Propst Gap Road about 3.4 miles from Franklin by Mr. Hamilton and the area was worked by a WPA crew under his supervision. The elevation is 2,600 feet - the exposure, northwest.

The surface is covered with a loose rock drift and boulders thinly covered with forest litter. The species were *R. cynosbati* and *R. rotundifolium*.

Dr. J. M. Ashcroft described the experiment as follows:

"A rectangular plot of one acre (2 x 5 chains) in an area closely covered with two species of Ribes mentioned above was divided into approximately equal halves (2 x 2.5 chains). From one half of the plot, Section A, only the canes and crowns of the bushes were removed, and the large roots left in the ground as little disturbed as possible. Care was taken, however, to insure the removal of all the crown. From the other half, Section B, the large roots connected to the crown were removed with the canes and the crown.

The number of bushes pulled from the area totaled 1,426 of which 1,355 were *Ribes rotundifolium* and 71 were *Ribes cynosbati*. From Section A, 21 *cynosbati* and 377 *rotundifolium* were removed; and from Section B, 50 *cynosbati* and 978 *rotundifolium* were pulled.

On reworking Section A on August 25, 1937, 62 root sprouts were found of which 12 were *cynosbati* and 50 were *rotundifolium*. On Section B, 12 root sprouts were found of which one was *cynosbati* and 11 were *rotundifolium*. The number of *cynosbati* roots sprouts found on Section A was 57.2% of the number of bushes originally on the area. The percentage for *rotundifolium* was 13.25%. On Section B, the corresponding percentages were 2% and 1.125% for *cynosbati* and *rotundifolium* respectively. Thus it appears that while *cynosbati* roots are more prone to sprout than are those of *rotundifolium*, significant increase in sprouting of both species occurs if the large roots are left in the ground. Moreover, all roots which were found to have sprouted had done so during the first growing season following the initial eradication."

FIELD STUDIES (Continued)

In Section A, where large roots were left in the ground, 52 bushes out of 398, or 15.57% sprouted; in Section B, where the large roots were removed as well as the crown, only 12 out of 1,028, or 1.67% sprouted. A third case of sprouting from ribes roots has been found in correspondence of Agent Kermit McKeever at White Sulphur Springs, West Virginia, of August 11, 1938. He writes, "While checking some crew work today, which was done on July 22, I found the enclosed ribes root. During eradication the root evidently was broken some distance below the crown, yet put out the shoot you see in 19 days."

The specimen of gooseberry (*R. cynosbati* or *rotundifolium*) which is still extant has a shoot about $1\frac{1}{2}$ inches long, and at the point of sprouting the root was only $1/8$ inch in diameter. The sprouting occurred $3/16$ of an inch back of the broken root end.

From the above three observations made in West Virginia in three counties in three different years, it is evident that:

1. Not all of the ribes sprouting can be attributed to leaving parts of the crown attached to the roots.
2. Both *R. cynosbati* and *R. rotundifolium* sprout from the roots.
3. A much higher proportion of large roots sprout than smaller roots - 15.67% as compared to 1.67% in Pendleton County.
4. Roots sprout when covered with 2 inches of earth (Pocahontas County test).
5. Roots as small as one eighth inch in diameter have sprouted. (Greenbrier or Monroe County observation)
6. Where large roots were left in ground, a much higher percent of *cynosbati* sprouted than *rotundifolium*, 57.2% of *cynosbati* sprouting in Section A, Pendleton County plot as compared to 15.25%. Little difference was noticed between the two species where only small roots were left, 2% for *cynosbati* and 1.125% for *rotundifolium*.

Note: Where large ribes roots cannot be removed they should be treated with chemicals just as the crown is treated where it cannot be removed. The matter of the depth of covering at which ribes roots cease to sprout should be looked into.

PINE INFECTION STUDY IN VIRGINIA

No field studies were made in Virginia during the year, except the pine infection plot. The following gives a resume of the progress of the disease from the beginning of the study.

Reddish Knob Drive Near West Virginia Overlook

	Accumulated	Totals	
	1942	1943	
Number of white pines	99	99	
Number infected	62	94	
Percent Infected	62.6	94.9	
Cankers	236	1,619	
Number dead	-	6	
Percent dead	-	6.0	
Average per tree infected	3, 3.81	17.0	
Average per tree on plot	2.38	16.3	
Number of ribes on plot	20	20	
Number of ribes-free sub-plots	1	4	
Average No. ribes per acre	20	20	

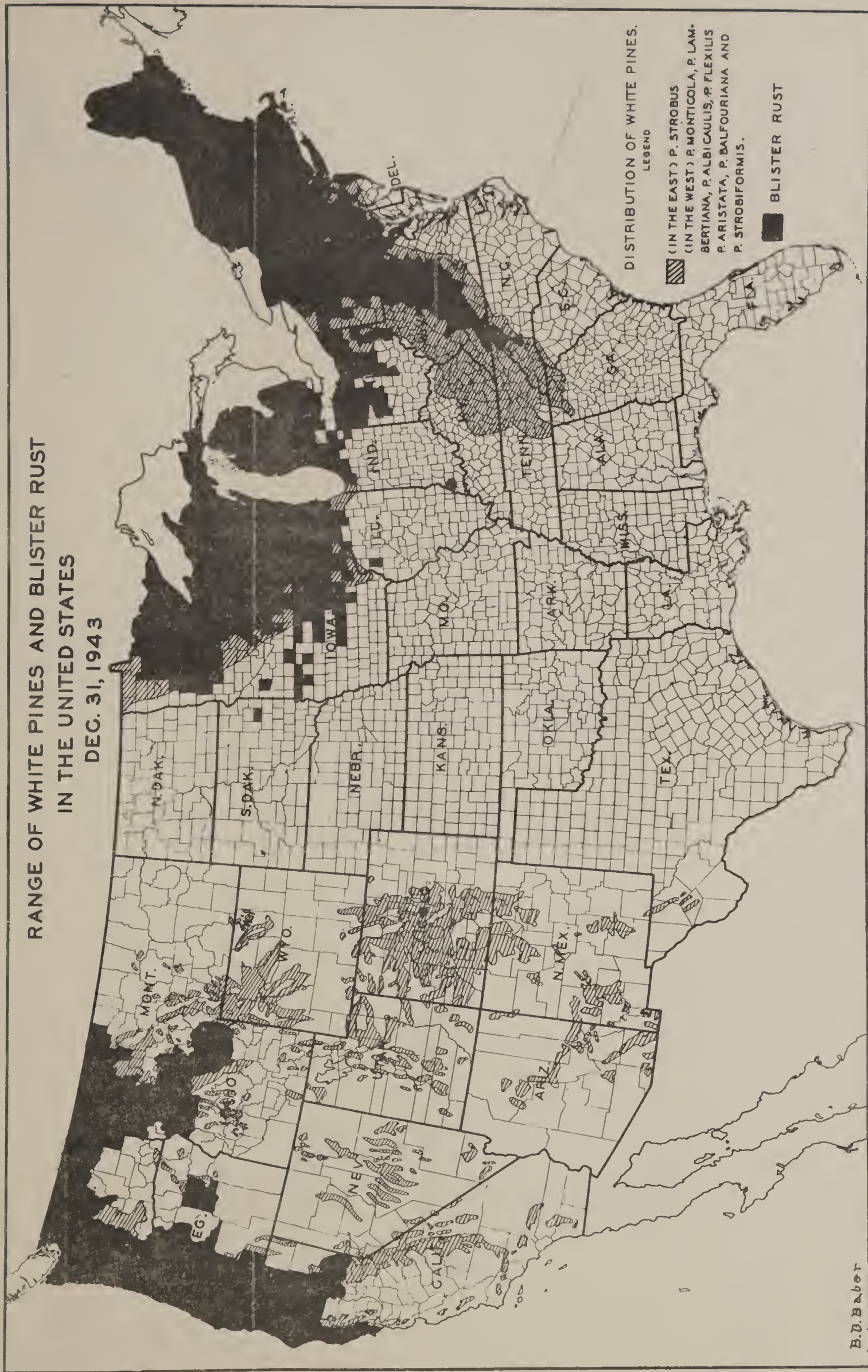
In West Virginia, while there are seven ribes regeneration study plots, all started in 1941, no inspections were made of them in 1943.

In Tennessee, the two Ribes curvatum plots in Bledsoe and Rhea Counties were studied in 1943, and in Georgia, one of the curvatum plots in Murray County was studied, the results appearing in Technical Memorandum No. 9 on October 14, 1943, entitled, "Notes on the Regeneration of the Georgia Gooseberry (Ribes curvatum Small) in Tennessee and Georgia, by Roy G. Pierce, Walter A. Stegall, et al.

In North Carolina, there are 10 ribes regeneration study plots in four counties, begun in 1940 and 1941. Nine of these were studied in 1943 by Mr. H. B. Teague, State Leader. Nothing conclusive can as yet be drawn from the data secured. Several of the plots will be abandoned, but the remainder will be maintained and examined either in 1944 or 1945.

In Maryland, several plots are still being maintained and will be inspected in 1944 or 1945.

RANGE OF WHITE PINES AND BLISTER RUST
IN THE UNITED STATES
DEC. 31, 1943



DISTRIBUTION OF WHITE PINES.
LEGEND
(IN THE EAST) P. STROBUS
(IN THE WEST) P. LAMBERTIANA, P. ALBICAULIS, P. FLEXILIS, P. ARISTATA, P. BALFOURIANA AND P. STROBIFORMIS.
BLISTER RUST

Report of
WHITE PINE BLISTER RUST CONTROL
NORTH CENTRAL REGION, 1943

by

Henry N. Putnam
Senior Pathologist

and

Leiton E. Nelson
Associate Forester

BLISTER RUST CONTROL, NORTH CENTRAL REGION, 1943

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Glossary of Terms Used in Blister Rust Control

North Central Region

- Acres Worked - Acres covered in searching for and eradicating ribes from within a control area including the pine block and surrounding protective zone.
- Ascospore - The yellow colored spore produced in the spring on white pine tissue infected with the blister rust fungus, Cronartium ribicola Fisch. It is capable of infecting only ribes leaves.
- Serial Stage - The stage in the development of a blister rust canker in which ascospores are produced. This stage occurs on that portion of the canker bearing pycnia the previous season.
- Blister Rust - A fatal disease of white pine trees caused by a parasitic fungus, Cronartium ribicola Fisch. It affects the various species of white or five-needled pines and wild and cultivated ribes. The disease is capable of killing white pine trees of all ages.
- Blister Rust Control - Separation of the alternate host plants, white pines and ribes by:
- A - Eradicating ribes within infecting range of white pines.
 - B - Selection of ribes-free sites for planting white pines.
 - C - Restricting planting of ribes to points outside of control areas.
- Cankers - That portion of a white pine tree bearing the disease caused by blister rust. Several canker stages are recognized as follows:
- Incipient - The first recognized appearance of a blister rust infection either as a small circular yellowish discoloration around the base of the needle through which infection entered or a somewhat enlarged, spindle-shaped swelling without any evidence of pycnia.
 - First Pycnia - The young cankers showing only fresh pycnia appearing as dark-colored, sticky drops on the diseased portion of the bark.

Pycnial Scars - Cankers showing dried pycnial drops. These appear as dark-colored, unbroken scars on the bark of the diseased portion.

First Aecia - A canker showing aecia for the first time. In the spring when aecia are produced small blisters are formed full of yellowish spores. Each blister is covered with a thin membrane giving the unbroken blister a whitish color. After this skin is broken and the spores are released there remain small openings in the bark with the bark broken in triangular pieces where the spores escaped. Aecia are formed on that portion of the canker producing pycnia the season before.

Aecia More Than Once - The canker showing that it has produced aecia more than one year. Aecia are first formed near the center of the canker and in successive years at farther distances from the center in either direction. Blisters where aecia have been produced in other years are easily recognized by an old weathered appearance in contrast to the fresher aecial oraters.

Dead Cankers - The canker stage in which the branch or trunk has been completely killed by the rust. Since blister rust is an obligate parasite it cannot live on entirely dead host tissue.

Canker Elimination - The removal of those portions of a white pine tree infected with white pine blister rust. As a safety factor the cankers should be removed at a point 4 to 6 inches beyond the farthest point of discoloration.

Checking - The examination of an area to determine the occurrence and abundance of ribes bushes in relation to ribes eradication. Several types are recognized:

Administrative Checking - A general examination of the worked area without taking systematic data to determine whether or not in the judgment of the checker satisfactory control work has been performed. This type of check is also used in examining the work of an eradication crew as it progresses.

Regular or Systematic Checking - Upon the completion of ribes eradication work on an area or portion of an area the ground is systematically covered and ribes recorded by species, number of bushes, and feet of live-stem on measured areas. The standard of local control is 25 feet of live-stem per acre. If the area materially exceeds this rate, rework is indicated. A regular check is usually performed by recording ribes found on a strip $1/5$ of a chain wide and as many chains long as is necessary. A two percent check is afforded when these strips are run at 10-chain intervals. An acre consists of a strip 50 chains long and $1/5$ of a chain wide.

Advance Checking - This check is made on an area just prior to actual ribes eradication primarily for the purpose of delimiting on the ground areas requiring crew work. It is similar to scouting except that systematic data are taken in the same manner as on the regular check.

Post-Check - This is a systematic survey on an area several years after ribes eradication to determine whether rework is necessary, when it should be performed or whether the area can be placed on maintenance. Ribes data are taken by the method described under the regular check.

Control Area - The total area to be worked for ribes to protect a block of white pine. It includes the acreage of white pine and the acreage of a protection zone surrounding a white pine block. The width of a protection zone varies from 50 feet, in case of live dense swamp to 900 feet in the open.

Control Area Permit - A certificate issued by the responsible State Agency to a nursery or other shipper allowing shipment of ribes only to locations outside of duly established white pine control areas.

Cultivated Black Currant - Ribes nigrum Linn. The European black currant quite widely grown for its fruiting in the white pine regions. It is the ribes species most susceptible to the rust and capable of causing damage to pines a mile away. It is chiefly responsible for the establishment of new pine infection centers.

Feet of Live-Stem of (F.L.S.) - Lineal measurement in feet of all living stems and branches. It is used as a measure of size of bush or volume of ribes on an area.

- Flag - The dying or dead portion of an infected white pine branch or stem beyond the canker characterized by brownish or reddish needles in contrast to the green of healthy foliage.
- Gross Acreage Worked - Total acreage of control area from which ribes have been removed since the beginning of the control program.
- Host Plants - White or five-needled pines and the various species of currants and gooseberries (Ribes) susceptible to white pine blister rust.
- Initial Eradication - Removal of ribes from the control area for the first time. Also called "first working".
- Local Control - The protection of the white pine stand against blister rust by the removal of ribes bushes within the stand and for a varying distance up to 900 feet around it.
- Maintenance - The establishment of control. The status of a control area wherein the scarcity of ribes assures effective blister rust control for an indefinite period such that no further working, except perhaps scouting, is needed during a current forest cycle unless the major ecological change, such as fire, results in a renewal of the ribes population. In this event the area reverts to a rework status.
- Natural Pine - Pine which has originated from seeds or parent trees naturally. This term is used to differentiate such pine from planted pine.
- Net Acreage - The most accurate and up-to-date estimate of acreage in white pine and control area. Included in the control problem this term is used in contrast with "Gross Acreage". For example, if originally an area of 500 acres had been initially worked and 100 acres subsequently destroyed by fire, the gross acreage would be 500 and the net acreage would be 400.
- Nursery Sanitation - Ribes eradication done within and around white pine producing nurseries. The nursery sanitation zone generally has a radius of one mile for Ribes nigrum and 1,500 feet for all other ribes species.
- Other Cultivated Ribes - All ribes grown under cultivation except R. nigrum such as red and white, Alpine currants, flowering currants and cultivated gooseberries.
- Pre-eradication Survey - The process of systematically surveying white pine areas and their environs prior to initial eradication, to map and evaluate the pine and to determine the abundance or ribes to be removed and the cost of their removal.
- Protective Zone - The area surrounding a pine stand, but not including it, up to 900 feet in width from which ribes are removed to protect the pine stand.

Re-eradication - Systematic eradication of ribes subsequent to initial eradication. Synonymous with reworking.

Resurvey - The process of a systematic examination of a control area several years after the pre-eradication survey but before initial ribes eradication. Resurveys are made to determine present pine values and ribes conditions and to revise maps made during the pre-eradication survey.

Ribes - Currant and gooseberry bushes.

Ribes Free Area - An area essentially free from currant and gooseberry plants.

Ribes Regeneration - Recurrence of ribes after eradication either from seed sprouts or improperly killed bushes.

Ribes Type - An area having definite related ecological conditions affecting ribes. Types are differentiated by vegetative growth. Ribes types in the North Central Region are recognized as follows:

- A - Ribes swamp type. Cedar, hardwoods, alder, tamarack, black spruce. Water usually flowing, deep humus, loamy soil, much brush windfalls. Ribes abundance heavy of one or more of eight species. Recommended width of protective zone 50 feet.
- B - Swamp type, muskeg. Water still, deep peat, dense growth, leather leaf, moss, scattered dwarf black spruce. Ribes free except at edges. Recommended width of protective zone 50 feet.
- C - Upland type, Hardwoods. Dry land, medium duff, sandy loam to clay loam, good soils, brush medium, mixed hardwoods, white pine. Ribes abundance none to heavy. Suggested width of protective zone 300 feet in dense stands, 600 feet in open stands.
- D - Upland type, Pine. Dry land, sand to sandy loam, brush light, Jack Pine, Red Pine, White Pine. Ribes abundance none to few. Suggested width of protective zone 600 feet.
- E - Upland type, pasture. Dry land, open fields, pastures. Soils vary. Ribes abundance few to medium. Often large bushes. Width of protective zone 600 to 900 feet depending on brush density.
- F - Cultivated. Area in crops or meadow and not needing any work except along fences, stone piles, etc. Suggested width of protective zone 900 feet.

Scouting for White Pine - The act of searching for white pine infection on living pines or ribes.

Scouting Ribes Graduation - The act of searching for and eliminating ribes from an area where white pines are not common. The chief purpose of scouting is to find likely sites for ribes. The work is done by men either working singly or in small groups traversing the area sufficiently close to find ribes stems and sufficiently far apart to conveniently cover the ground. The arbitrary distance between crew work and crew work is the distance between the crew. If such a distance is 20 feet or less the work is considered as crew work. If more than 20 feet it is scout work.

Sporidia (Spores of Sporidia) - Spores produced on the affected ribes leaves through the germination of teliospores. They are responsible for the infection of white pine trees through the needles.

Strip Areas - Area automatically reserved for ribes. A strip area is 13.2 feet or 1/5 chain wide and 37 chains long.

Telial Stage - The fall stage of white rust on ribes leaves. It consists of teliospores in columns about 1/8 inch in length. These columns are produced in the leaf portions of infected ribes leaves which originally produced sporidia.

Teliospores - Spores produced in closed hairlike columns on the underside of infected ribes leaves. Each teliospore germinates in place producing one or more rows of four sporidia each.

Uredinal Stage - The summer stage of white rust on the underside of ribes leaves. This stage produces uredospores. The uredinal stage appears to the naked eye and under a hand lens as an orange-yellow mound on the underside of the leaves.

Uredospores - Summer spores borne in uredinal wool on the underside of infected ribes leaves. These spores are capable only of infecting other ribes leaves. They are easily transported by air currents.

White Pine - Pinus strobus, L., called western or northern white pine. It bears its needles in clusters of five. It is a native of the West Central, Northwestern and Appalachian Regions.

White Pine Planting Site - An area favorable to growth of white pine on which it is planned to establish a white pine plantation.

Wild Ribes - All species of currants and gooseberries not cultivated but found growing naturally throughout the Region.

Summary of Blister Rust Control Program, December 31, 1943

North Central Region

Blister Rust Conditions

White pine blister rust continued to spread outwardly from established infection centers throughout the North Central Region in 1943. Intensification of the rust is pronounced in unprotected areas in the northern sections of the three Lake States, particularly in northern Minnesota. In contrast, no new pine infection centers were found in the four southern States in the Region. During 1943, infected white pines were found for the first time in only one county, namely, Calumet County, Wisconsin. Infected ribes bushes were found initially in six counties, namely, De Kalb County, Indiana; and Belmont, Harrison, Monroe, Shelby, Miami Counties, Ohio. Infected ribes have been found in all seven States of the Region and naturally infected pine in all States except Illinois and Indiana.

White Pine

During 1943, the pre-eradication surveys, post-checks, and resurveys revealed an increasing amount of white pine reproduction appearing under an overstory of white pine seed trees or as an extension around the outside of white pine stands. The planting of white pine has aided greatly in increasing the amount of white pine which is worth protecting. At the end of 1943, there were 1,153,414 acres of white pine considered worth protecting in the North Central Region. Resurveys and post-checks revealed that some stands of white pine no longer were considered worth protecting, due to losses in plantations, fire, or improper mapping during the early years of the control program. The total white pine listed in the control problem this year has decreased by 18,913 acres, chiefly in the Lake States. The value of white pine in the North Central Region was conservatively estimated in 1942 to be approximately \$103,709,755.

Local Control, 1943

During 1943, local control work was accomplished with Bureau Regular-Cooperative funds, Forest Service 3104 funds, Indian Service 3107 funds, Indian Tribal funds, and a small amount of C.P.S. funds. The local control work accomplished in 1943 is shown as follows:

Eradication	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-days Used
Initial	18,147	50,573	759,223	5,596
Re-eradication	24,371	58,646	1,301,969	9,892
Total	42,518	109,219	2,061,192	15,488

Status of Local Control on December 31, 1943

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
U. S. F. S.	193,844	418,532	269,924	98,381	64.4	23.5
U. S. I. S.	50,262	97,241	76,896	8,379	79.0	8.6
Non-fed. Public	291,982	776,371	598,921	154,106	77.1	19.8
Private	617,326	2,754,647	1,810,026	297,870	65.7	10.8
Total	1,153,414	4,046,791	2,755,767	555,736	68.0	13.8

Nursery Sanitation

Sanitation zones around 27 nurseries were checked for ribes during 1943. The ownership of these nurseries is listed as follows: Forest Service 2, Soil Conservation Service 1, State 10, County 1, and Private 13. Sanitation work done gave continuing protection to 19,050,700 white pine trees by removing 21,862 ribes from 10,016 acres of control area, at a cost of 304 man-days of labor. Most of the nurseries producing white pine in large amounts in the North Central Region now require only periodic examinations to keep them on a maintenance basis.

Cultivated Black Currant Elimination

Very little cultivated black currant elimination work was carried on in 1943 as a separate activity. During 1943, black currant elimination was performed incidental to other work only in Indiana, Iowa, and Ohio. During the year, 1,348 properties were inspected, 99 bushes on 20 properties were found, and 286 bushes on 71 properties, some of which were found in previous years, were destroyed. A total of 33 man-days was spent on this work.

Future Control Work

The shortage of man power makes it impossible during this present war period to give full protection to all valuable white pine in the North Central Region. By the use of teen-age boys, women, and old men, it is hoped that sufficient work can be accomplished to keep the disease in check, particularly on areas which have in the past been given initial eradication. An effort is being made to hold losses to a minimum and to provide protection to the very best stands of young white pine, where the need is most immediate.

Summary of Blister Rust Control, 1943

Illinois

Blister Rust Conditions

Up to the present time no blister rust has been found in Illinois on white pines. The rust has been found on ribes in 10 northern Illinois counties.

White Pine

Except for a few scattered locations of natural pine, the white pine found in Illinois is chiefly planted. White pine is proving very popular for windbreak and woodlot plantings. As of the end of 1943, there was a total of 3,508 acres of white pine worth protecting. The value of white pine in Illinois is estimated to be approximately \$1,600,000.

Local Control, 1943

Ribes eradication in 1943 was performed entirely on Regular-Cooperative funds shown as follows:

Working	Ownership Class	Acres White Pine Protected	Acres Worked	Ribes Pulled	Man-days Used
Initial	Private	133	723	46,565	189
Re-erad.	Non-fed. Public	409	1,400	87,470	601
Grand Total	All Classes	542	2,123	134,035	790

Status of Local Control, December 31, 1943

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Main-tenance	Initially Worked	On Main-tenance
Non-fed. Public	2,336	10,192	8,941	723	87.7	7.1
Private	1,172	18,249	5,849	659	32.0	3.6
Total	3,508	28,441	14,790	1,387	52.0	4.8

Nursery Sanitation

During 1943, nursery sanitation work was done on five private and one State-owned nursery to protect a total of 367,000 white pine trees,

by the removal of 1,006 ribes from 1,935 acres of control area at a cost of 37 man-days. Most of the white pine producing nurseries in Illinois are now in a sanitary condition and require only periodic maintenance work.

Cultivated Black Currant Elimination

There was no systematic C.B.C. elimination program in Illinois during 1943. However, 92 cultivated black currants were destroyed in connection with nursery sanitation. A total of 805 cultivated black currant bushes has been destroyed up to the present time.

Future Control Program

There still remain some acreage of white pine to be mapped in Illinois. However, due to the lack of transportation during war time, this mapping is being postponed. Any post-war plans for blister rust control in Illinois should include this mapping. Initial local control work has been completed on 52 percent of the net control area. During the present war-time period, local control work will consist mainly of rework to continue the protection of white pine stands which have received initial protection.

Summary of Blister Rust Control, 1943

Indiana

Blister Rust Conditions

Blister rust infection was found on ribes for the first time in De Kalb County in 1943. Blister rust on ribes has been found in five Indiana counties. No infection has been found on white pine since it was first found on imported nursery stock in 1910 and destroyed.

White Pine

Except for a few acres of natural pine along Lake Michigan in the northwest corner of Indiana, white pine occurs chiefly as plantations. White pine has been planted quite extensively in northern and southern thirds of the State. White pine grows rapidly particularly in the southern part of Indiana. This part of the State is especially favored for white pine because growing conditions are excellent and ribes are scarce to absent. The value of white pine in Indiana was estimated in 1942 to be \$1,515,041.

Local Control Performed, 1943

Ribes eradication was performed on State and private lands with Regular-Cooperative funds, as follows:

Ownership Class	Acres W. P. Protected.	Acres Worked	Ribes Pulled	Man-days Used
	All Planted			
Initial, Private	167	1,522	28,414	112

The present status of local control is shown as follows:

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially On Main- Worked	tenance	Initially On Main- Worked	tenance
U. S. F. S.	70	391	-	-	0.0	0.0
Non-fed. Public	2,055	18,080	16,478	4,362	91.1	24.1
Private	5,786	119,128	57,450	28,767	48.2	24.1
Total	7,911	137,599	73,928	33,129	53.7	24.0

Nursery Sanitation

During 1943, one State-owned forest nursery containing 1,000,000 white pine trees was given a protection working. To protect 40 acres of nursery site a total of 208 acres of control area was examined by the State Leader. No ribes were found.

Cultivated Black Current Elimination

A total of 1,202 properties was inspected in 1943 in connection with scouting for the rust. One location with three bushes was found and 15 bushes removed from three locations. This work was accomplished with an expenditure of three man-days.

Future Control Program

During the present war period it will be impossible to complete the protection of all valuable white pine stands in Indiana. The work outlined for Indiana in the near future will consist mainly of examination of proposed planting sites so as to eliminate any excess ribes eradication work. The selection of ribes-free planting sites occurring chiefly in the southern portion will greatly facilitate the expansion of white pine planting in Indiana.

Summary of Blister Rust Control, 1943

Iowa

Blister Rust Conditions

During 1943, rust on ribes was found for the first time in several locations but not in any new counties. No new pine infection areas were found in 1943. Previously, infection on natural pines had been discovered in Dubuque County and on nursery stock in Story and Lyon Counties. Blister rust infection on ribes has now been found in practically all of the counties in the northeastern third and some in the northwestern part of the State.

White Pine

Principal stands of white pine in Iowa are found in the form of shelter belts scattered throughout the State, but chiefly in the northeastern third. There are approximately 12,000 white pine shelter belts in the State. A few stands of natural white pine occur in northeastern Iowa. According to an evaluation survey of shelter belts made in 1938, the owners placed an average value of approximately \$775.00 per shelter belt or \$9,300,000 as the value of white pine in Iowa.

Local Control in 1943

During 1943, local control work was performed entirely with Regular-Cooperative funds contributed by the Federal government, State and private owners. Local control work was performed on other public and private ownership as follows:

Working	Ownership Class	No. of Areas	Acres W. P. Protected	Acres Worked	Ribes Pulled	Man-days Used
Initial	Non-fed. Pub.	1	4	44	6,967	45
Initial	Private	32	26	220	6,587	57
Total Initial		33	30	264	13,554	103
Re-erad.	Private	104	57	513	4,833	108
Grand Total		137	87	777	18,437	211

Status of Local Control, December 31, 1943

Ownership Class	Total Control Problem			Net Control Area			
	Net Acres			Acres		Percent	
	No. of Areas	White Pine	Control Area	Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
Indian Service	2	45	500	206	-	41.2	0.0
State	14	285	2,245	1,579	3	70.3	0.1
Private	11,984	4,670	57,255	32,950	10,771	57.5	18.8
Total	12,000	5,000	60,000	34,735	10,774	57.8	17.9

Nursery Sanitation

Seven nurseries, two State and five private, producing 635,000 white pines, were given sanitation work in 1943. This was accomplished by the removal of 15,114 ribes from 2,156 acres of control area with an expenditure of 98 man-days.

Cultivated Black Currant Elimination

During 1943, 51 bushes on 16 properties were destroyed in connection with local control. Thirty inspections were made at which time 43 bushes were found on 14 locations. This brings the total destroyed to date to 6,942 bushes on 1,572 locations. Cultivated black currant elimination work is now considered to be approximately 72 percent initially completed.

Future Control Program

During the present war period, the program in Iowa will consist mainly of re-eradication on areas most immediately in need or, where white pine infection has occurred or threatens to become established in the near future. An effort will also be made to examine white pine stands for rust, especially where ribes infection occurred in the near neighborhood within the last few years. Travel will be kept to a minimum consistent with good control procedure.

Summary of Blister Rust Control, 1943

Michigan

Blister Rust Conditions

During 1943, no new counties were added to the list previously found to contain infected pines or ribes. The rust, however, continued to spread from the established centers particularly in the unprotected areas throughout the Upper Peninsula and the northern portion of the Lower Peninsula. Blister rust has now been found on white pine in 42 counties and on ribes in all but four of the 83 counties in the State.

White Pine

Most of the white pine in the Upper Peninsula and more than two-thirds of the Lower Peninsula is made up of second growth acreages. The increased demand for lumber during war-time has caused some cutting in immature stands. This is unfortunate, but apparently unavoidable. There are approximately 441,914 acres of white pine of sufficient value to warrant protection costs. The white pine stands throughout the northern part of Michigan are showing evidence of increased reproduction. The present value of white pine in Michigan is estimated to be approximately \$27,000,000. This figure does not include intangible aesthetic values, which are high.

Local Control in 1943

Ribes eradication in 1943 was performed under four programs: Bureau-Regular, Forest Service-Regular, Regular-Cooperative, and Civilian Public Service (Conscientious Objectors). The results of the 1943 work are shown as follows:

Working	Ownership Class	Acres W. P. Protected	Acres Worked	Ribes Pulled	Man-days Used
Initial	Forest Service	1,022	3,675	13,019	158
	Non-fed. Public	1,178	3,593	13,235	54
	Private	2,832	13,990	73,058	618
	Total	5,032	21,258	99,312	830
Re-eradication	Forest Service	1,393	3,286	110,761	725
	Non-fed. Public	1,464	4,180	24,959	127
	Private	3,465	11,594	116,518	798
	Total	6,322	19,060	252,238	1,650
Grand Total		11,354	40,318	351,550	2,480

Status of Local Control, December 31, 1943

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Main-tenance	Initially Worked	On Main-tenance
Fed. Forest Service	51,326	141,344	128,719	69,505	91.1	49.2
Non-fed. Public	143,853	337,794	305,024	102,087	90.3	30.2
Private	246,735	867,047	689,031	109,709	79.5	12.7
Total	441,914	1,346,185	1,122,774	281,301	83.4	20.9

Nursery Sanitation

During 1943, six nurseries were protected. The ownership of these nurseries is shown as follows: U. S. Forest Service - one, Soil Conservation

Service - one, State - three, and Private - one. These six nurseries contain approximately 11,509,700 white pine trees. These were protected by removing 4,664 ribes from 2,413 acres of control areas with an expenditure of 76 man-days.

Cultivated Black Current Elimination

There was no cultivated black current elimination program carried on in Michigan during 1943. To date, a total of 143,700 bushes have been destroyed on 14,859 locations.

Future Control Program

Through the results of post-check and re-survey, careful plans are being made to utilize fully the limited man power which is available during this present war. Those areas of good young white pine in most immediate need of local control will be selected for working. It is expected that unavoidably many unprotected pine stands will be lost within the next few years, due to the abundance of rust throughout the white pine areas in the State.

Summary of Blister Rust Control, 1943

Minnesota

Blister Rust Conditions

White pine blister rust is now scattered throughout the entire white pine producing areas of the State. A rapid intensification of pine infection is occurring in the northern part of Minnesota. There were no new counties added during 1943 to the list already found to have infected host plants within them.

White Pine

Minnesota contains the greatest amount of old growth sawtimber-size white pine of the three Lake States. There are approximately 282,808 acres of white pine considered worth protecting. This acreage is made up of 255,579 acres of natural and 27,229 acres of planted pine. This acreage, particularly of natural white pine, is increasing annually due to increased natural reproduction. A considerable amount of mapping in the inaccessible areas in the northern part of the state is needed. A valuation of \$20,530,000 has been placed on Minnesota white pine, based on replacement and stumpage value.

Local Control in 1943

Local control work was performed by the U. S. Forest Service, Regular-Cooperative funds, and Indian Service funds. The results of the 1943 local control work program are shown as follows:

Ownership Class	Acres	Acres Worked	Ribes Destroyed	Man-days Used
	White Pine Protected			
		<u>Initial</u>		
U. S. Forest Service	6,535	9,024	384,677	2,379
Non-fed. Public	135	234	5,095	265
Total Initial	6,670	9,258	389,772	2,644
		<u>Re-eradication</u>		
U. S. Forest Service	2,841	5,056	175,669	1,582
U. S. Indian Service	2,870	3,226	122,744	877
Non-fed. Public	567	788	28,131	485
Private	2	33	510	2
Total Re-eradication	6,280	9,103	327,054	2,946
Grand Total	12,950	18,361	716,826	5,590

Status of Local Control, December 31, 1943

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
U. S. Forest Service	113,377	201,566	75,941	22,947	37.7	11.4
U. S. Indian Service	19,539	30,169	28,247	7,836	93.6	26.0
Non-fed. Public	61,046	130,921	72,466	17,097	55.4	13.1
Private	88,846	277,640	207,416	34,608	74.7	12.5
Total	282,808	640,296	384,070	82,488	60.0	12.9

Nursery Sanitation

Two nurseries, one owned by the U. S. Forest Service and the other by the Minnesota State Forest Service, were given sanitation workings during 1943. These two nurseries, containing approximately 1,715,000 white pine trees, were protected by the removal of 107 ribes from 1,493 acres of control area with an expenditure of three man-days.

Cultivated Black Currant Elimination

No cultivated black currant elimination work was done in 1943. Initial work has been essentially completed and only a small amount of recheck work remains to be done. To date, 23,306 cultivated black currant bushes have been removed from 3,260 locations.

Future Control Program

Local control work in the immediate future will be confined to the northeastern part of Minnesota and on the Chippewa National Forest in the north central part. Local control work on the Superior National Forest and on State lands is urgently needed due to the rapid spread of blister rust in this portion. Most of the work in northeastern Minnesota will be done from camps. Work on the Chippewa National Forest can be accomplished by commuting crews. Much additional mapping remains to be done in the Superior National Forest and this will be accomplished as time permits.

Summary of Blister Rust Control, 1943

Ohio

Blister Rust Conditions

Blister rust on ribes was found for the first time in Belmont, Harrison, Miami, Monroe, and Shelby Counties in Ohio during 1943. No new locations of pine infection were found. The volume of ribes infection appears to be decreasing in Ohio which, it is believed, is due mainly to the almost complete elimination of cultivated black currants from the pine growing areas. Eight locations of pine infection have been found in eight counties in Ohio since work was first started.

White Pine

There are 35,713 acres of white pine in the Ohio control area, of which 3,236 are natural stands and 32,477 are planted. Over 90 percent is planted. This acreage is increasing annually due to the adaptability of white pine to growing conditions in the State. White pine and red pine are being widely used in planting in the Muskingum Conservancy Districts. A valuation has been placed by the owners on white pines in Ohio at \$117 per acre. On this basis, the white pine in Ohio would have a value of \$4,178,421.

Local Control in 1943

Local control work was performed in Ohio with Regular-Cooperative and C.P.-E. funds. The work accomplished is shown as follows:

Ownership Class	Acres	Acres Worked	Ribes Pulled	Man-days Used
	White Pine Protected			
		<u>Initial Eradication</u>		
Non-fed. Public	220	1,270	13,184	232
Private	413	2,603	26,766	211
Total Initial	633	3,873	39,950	443
		<u>Re-eradication</u>		
Non-fed. Public	534	3,528	2	7
Private	54	184	500	4
Total Re-eradication	588	3,712	502	11
Grand Total	1,221	7,585	40,452	454

Status of Local Control, December 31, 1943

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially On Main-Worked	Initially On Main-tenance	Initially On Main-Worked	Initially On Main-tenance
Fed. Forest Service	503	3,746	1,798	1,090	48.0	29.1
Non-fed. Public	15,368	93,875	33,160	4,285	35.3	4.6
Private	19,842	351,201	150,062	48,513	42.7	13.8
Total	35,713	448,822	185,020	53,888	51.2	12.0

Nursery Sanitation

Nursery sanitation work was carried on by Regular funds on one State-owned and two privately-owned nurseries. These nurseries containing 2,527,000 white pine trees, were continued in a protected status by removing 20 ribes bushes from 1,238 acres of control area with an expenditure of three man-days. Most of the nurseries in Ohio are now on a maintenance basis and require only periodic examinations.

Cultivated Black Current Elimination

During 1943, 220 cultivated black currants were destroyed on 52 locations in connection with scouting for the rust. The cultivated black currant elimination program in Ohio is essentially completed. The total bushes removed to date is 73,117.

Future Control Program

Due to the rather extensive white pine planting program in Ohio, a part of the local control work should consist of preliminary examinations of planting sites. By proper control of the selection of planting sites,

It will be possible to eliminate a great deal of difficult ribes removal work. Most pine stands on which blister rust has become established need additional work to maintain the protection already given them. Under the present travel and labor restrictions, it will be difficult to keep abreast of the spread of the rust and give protection to pine stands most in need.

Summary of Blister Rust Control, 1943

Wisconsin

Blister Rust Conditions

During 1943, blister rust on white pine was found for the first time in Calumet County in an unprotected pine stand. White pine blister rust now has been discovered on white pine in 56 counties and on ribes in all 71 counties.

White Pine

Wisconsin has an estimated 376,560 acres of white pine which are considered of adequate value to warrant protection cost. In addition, there are some 400,000 acres of white pine which at the present are not stocked sufficiently to justify the cost of control work. White pine continues to increase due to natural reproduction coming in under scattered seed trees or as extensions of present pine stands. The value of white pine in Wisconsin is estimated at \$36,706,615.

Local Control, 1943

Local control work during 1943 was done with Indian Service-Regular funds and Tribal funds, Forest Service-Regular funds, Regular-Cooperative, and private cooperation. The following table shows the amount of work accomplished during 1943:

Working	Ownership Class	Acres W.P. Protected	Acres Worked	Ribes Pulled	Man-days Used
Initial	Ind. Service	383	640	29,761	404
	Non-fed. Public	2,050	4,132	29,170	236
	Private	3,049	8,901	62,785	637
	Total	5,482	13,673	121,716	1,277
Re-erad.	Forest Service	2,050	3,075	89,480	896
	Ind. Service	2,079	3,714	436,234	2,810
	Non-fed. Public	910	2,814	12,931	220
	Private	5,676	15,255	81,177	850
	Total	10,715	24,858	999,822	4,776
Grand Total		16,197	38,531	721,548	6,053

Status of Control on December 31, 1943

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
U. S. Forest Service	28,568	71,485	63,466	4,839	88.7	6.7
U. S. Indian Service	30,678	66,572	48,443	543	72.7	0.8
Non-fed. Public	67,038	183,264	161,273	25,544	88.0	13.9
Private	250,276	1,064,127	667,268	64,843	62.7	6.0
Total	376,560	1,385,448	940,450	95,769	67.2	6.9

Nursery Sanitation

All of the 11 important white pine producing nurseries in Wisconsin have been given protection against blister rust. During 1943, one State and one county-owned nursery were checked for ribes. A total of 951 ribes was removed from 573 acres of control area with an expenditure of 97 man-days. These nurseries contain 1,297,000 white pine trees.

Cultivated Black Current Elimination

No work was accomplished during 1943. Since 1934, when the cultivated black current elimination program began in Wisconsin, a total of 37,051 bushes has been removed from 6,601 locations. This work has now been completed within the important pine producing counties in the State.

Future Control Program

Due to the rapid increase in blister rust infection, a great deal of local control work is needed. In order to give adequate protection to as much white pine as possible during this war period, it will be necessary to employ more women, teen-age boys, and old men who are not fitted for the more strenuous types of work, such as logging, mining, or food production. Indian women were used in 1943 and found adaptable to this kind of work. It will be necessary to plan carefully in order to provide protection to those pine stands which are subject to immediate damage.

Detailed Narrative Report, 1943

Foreword

As initiated in 1942, the organization of the 1943 report follows the same pattern. It is divided into four main parts, so arranged that separates will be available covering control work on National Forests and Indian Reservations to these respective agencies. The four divisions are listed below:

(1) BLR-1-3. Leadership, Coordination and Technical Direction. This includes summaries, general narrative section, omnibus and other tables covering all activities. Local control work is included for completeness.

(2) BLR-3-3. Cooperative Blister Rust Control on State and Privately Owned Lands. This includes tables and a discussion by States of work done and status of control on lands in non-federal, public and private ownership.

(3) BLR-4. Blister Rust Control Operations on National Forests. This includes tables and discussions of work done and status of control on each of the 11 white pine growing National Forests in this Region. Separates will include maps of each forest showing the status of control work.

(4) BLR-7. Blister Rust Control Operations on Indian Reservations. This includes tables and discussions of work done and status of control on each of the ten Indian Reservations producing white pine this Region. Separates will include maps of each reservation, showing the status of control work.

BLR-1-3. Leadership, Coordination and Technical Direction of White

Pine Blister Rust Control, North Central Region

Organization

Permanent Organization

The permanent organization in 1943, differing slightly from that of 1942, is shown in the accompanying chart. Changes, brought about by the war, occurred chiefly in the Milwaukee Office. These adjustments are shown below:

Mr. Paul A. Augs on January 1, 1943, assumed the position of Jr. Administrative Assistant, CAF-7, formerly held by Mr. Aaron E. Glasgow.

Mrs. Clara M. Winkler, CAF-3, was promoted on January 1, 1943 to Voucher Clerk, CAF-4.

Mrs. Elmina D. Colbo, CAF-3, was promoted to Bookkeeper, Payroll Clerk, CAF-4, on January 1, 1943.

Miss Marie L. Maurer, CAF-2, was promoted to Secretary to Regional Leader, CAF-3, on January 1, 1943.

Miss Frances M. Kloster was appointed as Clerk-Stenographer, CAF-2, on March 23, 1943.

Dr. E. E. Honey, Specialist in Control Studies, P-2, was transferred to the Plant Disease Survey Project, U. S. D. A., on July 28, 1943. His position was left unfilled.

Mr. L. B. Ritter, Minnesota State Leader, P-3, was temporarily detailed to the Timber Production War Project in Minnesota from October 16 to November 30, 1943.

Miss Ann M. Gallagher, CAF-3, was transferred from Farm Security Administration to State Leader's office at Madison, Wisconsin as Secretary to State Leader.

We lost some of our field supervisors, who either entered the armed forces or went into defense work at higher salaries.

Labor

We fared better than we had anticipated in obtaining labor for control operations. Most of the labor used was in the northern parts of Minnesota, Wisconsin, and Michigan. Few defense plants and relatively few farms are present in this portion of the Region. One of the major activities was lumbering and the production of pulp wood. In recruiting labor for blister rust control, care was taken not to enter into competition for men with logging operations. Teen-age boys, men too old for active logging, and Indian women were satisfactorily used in blister rust control work.

In the States of Ohio, Indiana, Illinois, and Iowa, fewer numbers of blister rust control laborers were needed. In these States the chief employers of labor were the defense factories and farms. High school boys were chiefly used in control work.

Teen-age boys were used on ribes eradication with as much success as could be expected. The majority of boys 16 to 17 years of age have only a limited sense of responsibility toward their work. This disadvantage is generally more pronounced in boys from cities than from the country. It is necessary for the crew foreman of a group of boys to constantly and repeatedly call their attention to need for proper alignment, spacing, and spotting bushes. It is difficult for these youngsters to keep their minds on the business at hand, namely, the finding and pulling of ribes bushes. Mr. Dowd in Ohio had fairly good success using teen-age boys from a football squad as designated by their Physical Director. With proper and close supervision, high school boys can be used with reasonable success during war times when better labor is not available.

The best labor used in 1943 consisted of the over-age men, 50 to 65 years old, who either were reluctant to leave their homes in the north for defense work, or were not physically able to do the hard manual labor of logging. Many of these men had had experience in blister rust control under the W.P.A. programs. For the most part they were steady, thorough workers, interested in the protection of the pines in their communities. Often they were effectively used as crew foremen of teen-age boys.

Indian women were used extensively for the first time as ribes predators on most of the Indian Reservations. They proved surprisingly proficient, and their accomplishments compare favorably with those of Indian men in former years. Indian women were used as crew leaders. These crews took pride in keeping good alignment and spacing, and in not missing ribes bushes. They did not seem to be irritated by mosquitoes, or the briars, both of which are abundant on Indian Reservations. An important advantage they possess over their men folk is that there was not the loss of one to several days working time after each pay day.

Man-months Employment

From Table 13 it will be noted that there was an employment during 1943 of approximately 1,091 man-months on blister rust control work in the Region. This is an average of 91.0 men per month, with the bulk of employment, 76 percent, occurring from May to September, inclusive. This is the lowest employment in the Region since 1933, when the C.C.C. and other emergency relief programs started. In fact, the 1,091 man-months employed in the Calendar Year 1943 is less than a third of the number, approximately 3,330 man-months, employed in the peak month of August, 1936.

However, the great majority of men working on blister rust control, 1933 to 1942 were employed on emergency relief programs. In 1943, the employment was principally on State and regular funds, and represents the highest employment on such funds since the work was organized on a regional basis in 1931. For example, in 1942, of the 2,664 man-months of employment, 1,889 were paid from emergency funds, leaving only 775 man-months, an average of 64.7 per month on State and regular funds, compared with 91.0 in 1943.

Automotive Equipment

The number of government-owned autos in use and disposed of in 1942 and 1943 is shown by makes and years in the accompanying table. At the end of 1943, we had 13 passenger cars and 37 trucks. The years of manufacture were as follows:

1935:	1 passenger car.	4 trucks
1936:	1 passenger car.	0 trucks
1937:	5 passenger cars.	5 trucks
1939:	2 passenger cars.	25 trucks
1940:	2 passenger cars.	3 trucks
1941:	2 passenger cars.	0 trucks
<hr/>		
Total	13 passenger cars	37 trucks

Government Autos in Use in 1942 and 1943,
North Central Region

Makers	Model	Year	In Use 1942	Sold 1942	In Use 1943	Sold or Declared Surplus 1943	On Hand Jan. 1, 1944
<u>Passenger autos</u>							
Ford	Coupe	1938	1	1	-	-	-
Ford 60	Tudor	1937	5	-	5	1	4
Ford 85	Tudor	1939	1	-	1	-	1
Chevrolet	Master Coach	1934	1	-	1	1	-
Chevrolet	Station Wagon	1934	1	-	1	1	-
Chevrolet	Master, 4-Door	1934	1	1	-	-	-
Chevrolet	Standard Coach	1935	4	1	3	2	1
Chevrolet	Standard 4-Door	1936	1	-	1	-	1
Chevrolet	Standard Coach	1939	1	-	1	-	1
Chevrolet	Standard Coach	1940	2	-	2	-	2
Studebaker	Champion Coach	1941	2	-	2	-	2
Pontiac 6	4-Door	1937	1	-	1	-	1
Total Passenger Cars			27	3	18	5	13
<u>Trucks</u>							
Ford	Pick-up	1929	1	1	-	-	-
Ford	Delivery	1933	1	1	-	-	-
Ford	Pick-up	1934	3	1	3	3	-
Ford	Pick-up	1937	3	-	3	-	3
Ford	Sedan Delivery	1940	1	-	1	-	1
Chevrolet	Pick-up	1934	1	1	-	-	-
Chevrolet	Sedan Delivery	1937	2	-	2	-	2
Chevrolet	Sedan Delivery	1939	3	-	3	-	3
Chevrolet	Pick-up	1940	1	-	1	-	1
Chevrolet	Sedan Delivery	1940	1	-	1	-	1
Plymouth	Pick-up	1939	20	-	20	-	20
Dodge	1-1/2 Ton	1933	1	1	-	-	-
Dodge	Pick-up	1935	15	7	8	4	4
Dodge	1-1/2 Ton	1939	2	-	2	-	2
Reo	2 Ton Dump	1936	1	1	-	-	-
Total Trucks			56	12	44	7	37
Grand Total Automobiles			77	15	62	12	50

Automobile Accidents

No record was made in the 1942 Annual Report of automobile accidents involving government-owned autos in 1941. Hence, accidents in 1942 and 1943 will be reported here. As listed below there were five automobile accidents in 1942, all minor, and no one was injured. During 1942, 77 government-owned cars were driven 307,233 miles. Thus there was a minor automobile accident per 77,445 miles.

In 1943, there were only one accident involving a government-owned auto. No one was injured. Since 237,630 miles were driven in 42 government-owned cars, and these automobiles are now several years old, with possibilities of breakdowns becoming ever more important, this is a very good record.

Details of accidents involving government-owned autos in 1942 and 1943 are shown as follows:

1. Plymouth Sedan, 1937 - License 2-4314
Place - Macomb, Illinois
Date of Accident - February 9, 1942
Cause - Government car driven by Edgar J. Colombe, State M.P.D. Foreman, at 25 miles per hour on icy road, skidded, spun around twice, and went into ten foot ditch, rebounding upright.
Damage - Trunk empty, driver not injured. Front fender cracked and bent. Left front fender, and front bumper damaged.
Repairs - Cost of towing and garage \$10.11 paid by Government. Labor furnished by M.P.D. Cost unknown.
2. Chevrolet Coach, 1934 - License 34-025
Place - Peoria, Illinois
Date of Accident - April 15, 1942
Cause - Government car parked on street was hit by privately-owned auto.
Damage - Left front fender of government car dented. Damage to private car not known. No one injured.
Repairs - Government fender repaired and paid for by driver of private car at cost of \$4.00.
3. Chevrolet Coach, 1940 - License 2-5115
Place - Angelo Station, Illinois
Date of Accident - April 18, 1942
Cause - Private car driven by Harold J. Robinson, turned around unexpectedly in vicinity ahead of government car driven by E. F. Smith. Rear bumper of private car hooked on to underside of rear left fender of government car.
Damage - No one injured. Private car not damaged. Rear left fender of government car damaged beyond repair.
Repairs - Repairs to government car, \$25.43 paid by owner of private car.

4. Chevrolet Coach, 1934 - License A-5201
Place - Dixon, Illinois
Date of Accident - September 18, 1942
Cause - Privately-owned car driven by Mr. Nick Sklavenetis
 hit empty government car in rear while it was parked.
Damage - On government car, left rear fender, tail light,
license plate smashed. Damage to private car not known.
No one injured.
Repairs - Government car repaired at cost of \$15.00 paid
for by Mr. Nick Sklavenetis.

5. Ford Panel Truck, 1940 - License A-5209
Place - Aurora, Minnesota
Date of Accident - September 22, 1942
Cause - Government car driven by Clifford E. Kirchhof,
Assistant Superintendent, W.P.A., was just leaving
parking space on street. Private car driven by
Mr. Mike Potocnik hit left end of bumper on government
car with right end of bumper on private car.
Damage - Broken front bumper on government car. Bent
front bumper on private car. No one injured.
Repairs - Repairs to each car paid for personally by
respective drivers. Cost of repair on government
car, \$1.50.

6. Chevrolet Sedan Delivery Truck, 1939 - License A-5151
Place - Antigo, Wisconsin
Date of Accident - February 3, 1943
Cause - Government car driven by District Leader Ray
Weber came out of service station driveway at speed
of five miles per hour. Roadway slippery. Unable
to stop, and collided with private car driven by
Laddie Novak on highway, also unable to stop because
of ice. High banks of snow on either side of service
driveway prevented driver of government car seeing
approaching car.
Damage - To government car, slight damage to left front
fender. To private car, bent bumper, broken radiator
grill, punctured radiator core. No one injured.
Repairs - None needed on government car. Repairs to
private car, costing \$100.35 submitted to Congress
for appropriation under Small Claims Act. Action
not known.

Compensation Cases

No reference was made to compensation cases in the 1942 Regional Report. Hence, there are reported here cases which were processed through the Milwaukee Office for both 1942 and 1943. These are shown in the following table:

Number of Compensation Cases, Processed Through the Milwaukee Office
1942 and 1943

State	Eye Injury	Ivy and Other Plants Poisoning	Infection	Cuts, Sprains, Fractures and Bruises	Total
<u>1942</u>					
Illinois	-	-	3	-	3
Michigan	-	-	-	1	1
Wisconsin	-	1	-	-	1
<u>Total, 1942</u>	-	1	3	1	5
<u>1943</u>					
Michigan	1	1	-	1	3
Minnesota	-	1	-	-	1
<u>Total, 1943</u>	1	2	-	1	4

All of the above injuries were sustained in connection with actual field work. None of them proved serious.

Time lost time resulted as follows:

1942 3 Infections Lost time: 10 calendar days
 1 Bruise Lost time: none
 1 Poison Ivy Lost time: none
1943 1 Eye injury Lost time: 6 1/2 calendar days
 2 Poison Ivy Lost time: 29 calendar days
 1 Cut finger Lost time: none

The number of compensation cases reported to the Milwaukee Office 1936 to 1943 are shown in the accompanying table. These do not cover injuries sustained by men employed under the State W.P.A. program, C.O.C., or State. They do include all cases involving men paid through the Milwaukee Office.

Practically all of the 275 injuries reported were sustained in actual field operations. To the best of our knowledge none of them were in connection with automobile travel, through accidents or otherwise.

Ivy poisoning, with 89 cases, was the most common cause of injury. To reduce this source of injury, pamphlets on the description of the plant, and preventive and curative treatments have been freely circulated. The men have been taught to recognize the plant and to avoid it as part of their training.

Injuries from cuts, sprains, fractures and bruises, 21 cases, are the second most numerous. This classification is so all inclusive that it contains a large number of injury cases. The prevention of these types of injuries is largely dependent upon experience. Suggestions concerning the handling of axes, grubbers, Bitter picks, etc., in the woods are helpful in preventing such accidents.

Injuries to eyes, chiefly due to twigs and branches are always quite common in ribes eradication work. To a certain extent these are difficult to avoid, because of the necessity for going through thick brush, and focusing on the ground for bushes. Precautions, such as avoiding letting branches swing back and hit others reduce the chances for eye injury.

The three classifications of injuries discussed above make up 83 percent of the 278 cases reported.

Compensation Cases Reported to Milwaukee Office,
1935 to 1943

Year	Dog Bites	Heat	Insect Canned Injury	Eye Injury	Ivy & Other Plant Poisoning	Infection	Cuts, Sprains, Fractures, Bruises	Misc.	Total	No. per 1,000 Man-years.
1936	-	3	4	22	14	7	34	3a	87	7.25
1937	-	-	-	5	2	2	4	-	13	2.84
1938	-	-	-	13	19	7	15	-	54	10.85
1939	3	-	3	8	26	1	7	1b	49	10.75
1940	1	-	2	5	13	2	11	-	34	9.80
1941	1	-	1	7	12	3	8	-	32	9.10
1942	-	-	-	-	1	3	1	-	5	11.29
1943	-	-	-	1	2	-	1	-	4	9.09
Total	5	3	10	61	89	25	81	4	278	8.17

a - 1 rash, 2 organic
b - 1 frost injury

Authorization and Sources of Funds

As in the past several years, the work in 1943 was continued under Memoranda of Agreement drawn up between the responsible State Agencies and the Bureau of Entomology and Plant Quarantine. These and other memoranda governing blister rust control are shown in the 1936 Regional Annual Report, and are not repeated here.

During 1943, work was performed on funds furnished from the following sources:

1. State and Private

- a. Direct aid (Ribes eradication matched by 3103 Federal)
- b. Indirect aid (Other services)

2. Federal Blister Rust Appropriation

- a. 3101. Leadership, coordination, and technical direction
- b. 3103. Cooperative blister rust control on State and private lands. (Matched by State direct aid)
- c. 3104. Blister rust control on National Forests in Michigan, Minnesota, and Wisconsin
- d. 3107. Blister rust control on Indian Reservations in Minnesota and Wisconsin. (Matched by Tribal funds on the Menominee Indian Reservation)

3. Bureau sponsored State W.P.A. Projects in Michigan and Minnesota. (A small amount of funds spent in January, 1943, to complete State W.P.A. activities)

4. Civilian Public Service (Conscientious Objectors' Camps) in Michigan and Ohio

Spread of the Rust

The weather in 1943, as in each of the years since 1937, continued to be favorable to the spread of the rust. Frequent showers throughout the growing season with relatively cool temperatures prevailed. Ribes and pine infections were reported from counties where the rust had not hitherto been observed. An increase in pine infection both in the intensification of the rust at known centers and an extension of the areas of infection were noted. Particularly in the northeast portion of Minnesota was the rust active. The general status of rust spread at the end of 1943 in each of the States in the Region was as follows:

Illinois

Only a small amount of scouting was done in 1943. No pine infection was found, although during the year 12,100 white pines were inspected at 175 locations in 14 counties. Most of this inspection was done in connection with pre-eradication survey work. Rust was again found at one location of cultivated black currants where it has been found yearly since 1937. Strangely enough, however, no rust was found at several locations of cultivated black currants where it had been observed in previous years. To date, rust has been found on ribes in ten northern counties.

Indiana

Infected cultivated black currants were found for the first time in De Kalb County in the northeast portion of the State. This brings to five the number of counties where infected ribes have been found. No infection has been discovered on white pine since it was first found on imported nursery stock in 1910 and destroyed.

Iowa

No blister rust on ribes was reported for the first time in new counties in Iowa. However, ribes infection was quite general in northeastern Iowa in localities where it had previously been reported. Rust on Ribes americanum and R. missouriense growing near white pine in two of the unprotected white pine producing nurseries was found in 1943. To date, infected ribes have been found in 33 counties, or one-third of the State. Previously rust on pines had been discovered on natural white pine in Dubuque County and on nursery stock in Lyon and Story Counties. With the rust situation being what it is in Iowa there are great potentialities for a bad blister rust outbreak if weather conditions become particularly favorable. This is especially true as applied to shelter belts because cultivated ribes are usually found close to the shelter belts and wild ribes are usually found growing within the shelter belt itself, evidently started from seed dropped by birds. Thus, each white pine shelter belt becomes a potential focal point of infection.

Michigan

Infection on ribes in the northern part of the State is universally heavy because of the cool, moist weather prevailing in that section. Ribes infection was not so pronounced in the southern counties. No new counties were added to the list of those containing infected ribes. To date, rust on ribes has been reported from 79 of the 83 counties in the State. The only counties from which no rust on ribes has been reported are Calhoun, Hillsdale, Lenawee, and Monroe, in the southeastern corner of the State.

While no pine infection was reported for the first time from any of the counties, there was a noticeable intensification of the rust on pine in unprotected stands. This was especially true in the Huron Mountain section of Marquette County and also in Iosco and Delta Counties. An increase in pine infection was noted in Benzie, Cheboygan, and Osego Counties in the Lower Peninsula. To date, infection on pine has been reported from 42 of the 83 counties in Michigan, including all 15 counties in the Upper Peninsula.

Minnesota

No new counties were added in 1943 to the list of those infected for the first time. However, evidence of rapid intensification of the rust, especially in northeastern Minnesota was found. It is apparent that conditions of abundant moisture and cool temperatures which prevail in northeastern Minnesota are extremely favorable to the development of the rust. As described farther on in this report Pinus peuce, a species hitherto regarded as quite resistant to the rust, was found heavily infected at distances of more than 900 feet from the nearest ribes. The action of the rust is so rapid in northeastern Minnesota that inevitably millions of young white pines growing on several thousands of acres will be killed by the rust before they can be protected by removal of ribes. To date, rust has been reported on ribes from 36 counties and on pine from 32.

Ohio

Rust on ribes was found for the first time in 1943 in Belmont, Harrison, and Monroe Counties in the extreme east central portion, and in Shelby and Miami Counties in the west central part. This brings to 44 the counties where infected ribes have been found since 1933.

No additional pine infection was found in 1943. An effort was made to destroy all cankers known to exist. To 1943, pine infection had been reported from nine counties, chiefly in the northeastern quarter of the State.

Wisconsin

Previous to 1943, rust on ribes had been reported from all 71 counties in the State. Ribes infection was general, particularly throughout the northern portion. During August and September, telial columns were abundant and could be found on nearly all of the ribes growing in the northern counties.

During 1943, blister rust on white pine was found for the first time in Calumet County in the east central part of the State. This brings to 56 the number of counties in which white pine infection has been found. The rust had damaged pine so heavily in some unprotected pine stands that control work was no longer feasible because the white pine values had already been destroyed. As an example of this, the Phelps School Forest Plantation in Vilas County, established in 1934, showed 82 percent of the trees infected. The largest number of cankers apparently originated during 1938 and 1939. In another unprotected plantation in Langlade County 61 percent of the pines were infected.

As a contrast between protected and unprotected stands, an examination of an unprotected pine area in Sawyer County showed 70 percent of the trees infected while in a protected area in the same locality less than five percent of the trees were infected.

White Pine

A discussion of white pine from the standpoints of its intrinsic lumber value, of its aesthetic, soil protection, and cultural values, and as a basis for gainful employment is given in the 1942 Regional Annual Report, and will not be repeated here. Its commercial value alone was estimated at \$105,709,795.

Values and Uses

Particularly during these war years the uses of white pine as boxes, crates, pattern stock, map rollers, dairy supplies, furniture, shuttles, etc., have greatly increased. It is extensively used in ship building. Because of its workability, durability and freedom from resin, white pine lumber will be in demand for many different purposes both in war and peace times.

In supplying the increased demands occasioned by the war it is inevitable that many young trees will be cut. Under normal conditions it would be economically sound to allow these trees to reach commercial maturity.

One silvicultural effect of this premature and intensive cutting of white pine is to reduce greatly the continuous supply of seeds on which natural white pine reproduction is dependent. This in turn emphasizes more than ever the great importance of doing everything within our power to prevent loss of young white pine trees from blister rust. In our work, as in other phases of forestry, it is not sufficient to look forward only to the saving of the immediate crop of white pine, but to suppress ribes permanently on white pine sites, so that white pine may be perpetuated on thousands of acres best suited to that purpose.

Since 1940, severe outbreaks on red and jack pines of an injury associated with or caused by the spittle bug have been reported from northern Minnesota, northern Wisconsin, and both the Upper and Lower Peninsulas of Michigan. Young trees, up to 20 feet in height, both natural and planted, are completely killed in five to nine months after the first symptoms are apparent. White pine seems to be immune from this injury. Particularly in northeastern Wisconsin several thousand acres of red and jack pine plantations were wiped out in 1943. Investigative work is being organized on this pest, but so far no effective control measures are known. Wisconsin Conservation officials are considering discontinuing the planting of red and jack pine on sandy soils in northeastern Wisconsin even though this soil is best suited for these species. One result of this situation is to stimulate the planting of white pine even on soils usually considered not best adapted to that species.

White Pine Cut in 1942

Significant information on stumpage and log prices of white pine are obtainable from "Stumpage and Log Prices, 1942", by Henry B. Steer, U. S. D. A. Stat. Bulletin 79 published January, 1944. The following data are taken from that bulletin:

Stumpage and Log Prices of White Pine, per M. Board Feet
 Derived From Sales, 1942 (From "Stumpage and Log Prices,
 1942", by Henry B. Stear, U.S.D.A. Statistical Bulletin 79,
 January, 1944)

State	Ave. Stumpage Prices per M. Board Feet		Ave. Log Prices per M. Bd. Feet
	Second Growth		All Sales
	All Sales	Only	
Indiana	-	-	\$22.92
Michigan	\$10.22	\$9.27	29.93
Minnesota	5.71	6.29	24.04
Ohio	-	-	10.00
Wisconsin	10.60	10.09	26.16
Arithmetical Average	8.84	8.22	22.61

The second growth stumpage in Minnesota brought a higher price than the average for the State. The factor of accessibility is probably responsible. Second growth white pine occurs chiefly in the northern counties within 75 miles of the Twin Cities. Virgin white pine in commercial amounts are chiefly in the relatively inaccessible areas in northeastern Minnesota.

In Table 3 of the above described bulletin, from which the white pine stumpage and log sales prices were obtained, there are data from 22 eastern States. It is interesting to note that the average white pine stumpage from all of them was \$6.58, ranging from \$4.09 in Kentucky to \$10.60 in Wisconsin. Indeed the stumpage prices in Michigan, \$10.22, and in Wisconsin, \$10.60 were materially higher than in any of the other States. The next highest stumpage was \$8.43 in West Virginia.

In the average price per M. board feet of white pine logs, the three Lake States compared favorably with the other States in the northern white pine range. With an average for the 22 States of \$20.76 per M. board feet for white pine logs, the range of prices was from \$8.50 in Kentucky to an unaccountable high of \$84.89 in Delaware. With the exception of the price in Delaware, the highest price was in Michigan, \$29.93, followed by Wisconsin, \$26.16, then Maryland, \$25.00, and Minnesota, \$24.04.

An idea of the production of white pine lumber in 1942 is shown in the following tabulation from the same bulletin.

White Pine Stumpage and Log Sales, 1942, Lake States (From "Stumpage and Log Prices, 1942", by Henry B. Stear, U. S. D. A. Statistical Bulletin 79, January, 1944)

State	Stumpage Sales, 1942			Log Sales, 1942		
	No. of Transactions	Quantity M Bd. Ft.	Value	No. of Transactions	Quantity M Bd. Ft.	Value
Michigan	17	2,026	\$20,705	12	5,323	\$159,313
Minnesota	18	3,527	20,130	17	6,498	156,226
Wisconsin	50	5,020	53,221	55	31,458	822,933
Total or Average	85	10,573	\$4,059	114	43,279	1,138,472

The values as shown by white pine stumpage and logs cut in 1942 in the Lake States represent only a small fraction of the yearly cut of virgin white pine in the 1890's. Most of the white pine lumber produced in 1942 was second growth. The largest proportion of virgin timber in 1942 came from northeastern Minnesota, and from the Menominee Indian Reservation in Wisconsin. The latter is chiefly responsible for the relatively large production of white pine logs in Wisconsin.

The values of \$4,059 white pine stumpage, and \$1,138,472 logs cut in 1942 can be expressed in terms of labor. These represent only the values in the woods. In terms of total employment in the production and use of articles manufactured from white pine such values are multiplied many times. The objective of the blister rust control program is to do its important share in assuring the continued production of white pine grown on lands best suited to that purpose, so that a sustained yield of this valuable timber may be maintained indefinitely and even increased.

In order to obtain an idea of the relationship of the cut of white pine to the total softwood cut in 1942, the following table showing percentages is given.

Percentages of White Pine of Total Softwood Stumpage and Logs Sold in 1942

State	Percent W.P. Bd. Ft. Measure	Percent White Pine Value	Percent W.P. Bd. Ft. Measure	Percent White Pines Value
Michigan	8.3	21.8	15.3	21.8
Minnesota	26.8	28.8	82.7	85.9
Wisconsin	24.7	35.1	11.6	10.7
Average	18.3	29.7	13.8	13.3

Some interesting comparisons between the cut of white pine and all softwoods in the Lake States in 1942 are presented by the above table.

For the three States as a whole, white pine made up 18.5 percent by volume and 29.7 percent by value of total softwood stumpage sold in 1942. This increased percent in terms of dollars represents the increased value of white pine over other softwood stumpage. In every State white pine commanded the highest stumpage price of any of the conifers. This is particularly noticeable in Michigan.

The same relationship, although not so pronounced, existed in Michigan and Minnesota as applied to log values. This trend was reversed in Wisconsin, due to the fact that the value of eastern spruce logs exceeded that of white pine. Furthermore, since 89.4 percent of all softwood logs sold in the Lake States in 1942 were from Wisconsin, this weight brought the percentage of white pine logs on a money basis below that on a volume basis.

White Pine Acreages

A comparison between the total regional control problem as given in the 1942 Report and that of 1943 shows a slight reduction as follows:

Year	Total Control Problem, Acres			
	Total	Planted	Total	Control
	White Pine	White Pine	White Pine	Area
1942	980,324	192,003	1,172,327	4,112,284
1943	960,979	192,435	1,153,414	4,046,791
Differences	- 19,345	+ 432	- 18,913	- 65,493

The loss in pine acreage, occurring entirely in natural pine, resulted from resurveys made in 1943. Certain acreages previously included in the control problem were thrown out for a variety of reasons, such as: sufficient white pine values no longer were present, errors in original surveys, loss of white pine because of fire, blister rust, etc. In certain cases, increases in acreages were reported, due to extensions of areas by reproduction, etc., but these increases did not compensate for decreases. It should be understood that there is an estimated total of 100,000 acres of white pine in northeastern Minnesota not yet surveyed, and not included in the above figures.

Interesting information relative to the condition of the forest area in the Lake States in 1938, as determined by the Forest Survey is given in "Forest Areas and Timber Volumes in the Lake States", by R. N. Cunningham and H. C. Moser, (Economic Notes No. 10, 1938, published by the Lake States Forest Experiment Station, St. Paul, Minnesota). The following table shows the forest cover types on the 55,634,400 acres classified as forest land in the three Lake States:

Forest Cover Type	Acres	Percent of Total
Deforested	11,244,100	20.2
Aspen-birch	16,671,800	30.0
Northern Hardwoods	8,214,600	14.8
Oak	3,519,000	6.3
Spruce-fir	3,147,300	5.6
Jack pine	2,706,000	4.9
Spruce swamp	2,332,800	4.2
Ash-elm	1,973,100	3.5
Scrub forest	1,702,900	3.1
Cedar swamp	1,220,600	2.2
Tamarack swamp	1,106,900	2.0
Non-productive swamp	836,100	1.5
White pine	619,700	1.1
Red pine	339,500	0.6
Total	55,634,400	100.0

More acreage of white pine is shown in the blister rust control area than is supplied by the Forest Survey. This comparison is shown below:

Acreage of White Pine in Lake States

Source	Michigan	Minnesota	Wisconsin	Total
Blister Rust Control Area				
Natural Pine	362,045	255,518	339,025	956,588
Forest Survey, 1938	171,000	233,700	215,000	619,700
Differences	191,045	21,818	124,025	336,888

The rather large increases in acreages of white pine reported in the control areas are due to differences in the basis of classification of white pine types by the two agencies. The Forest Survey divided forested areas into "Forest Cover Types", according to the following definitions: "Stands were classified into forest cover types according to the predominance of a key species or group of species. The white pine cover type, for example, includes stands consisting 50 percent or more of this species. . . . The term 'predominant' as used in these definitions, means composing 50 percent or more of the total volume in cordwood and saw timber stands or more than 50 percent of the unsuppressed trees in reproduction stands."

The Blister Rust Control Organization, giving particular attention to young stands, classifies as white pine worth protection all areas on which there are thrifty white pines per acre at the rate of 200 trees up to six feet in height; 100 trees six feet to 15 feet; and 75 trees more than 15 feet tall. The aspen-birch type, occupying over 16,000,000 acres, is a common nurse crop for white pine reproduction. It is probable,

therefore, that many areas, classified by the Forest Survey as open-
 birch, contained a sufficient understocking of white pine reproduction
 to be considered as white pine worth protecting.

Planted and Natural White Pine

White pine is a favorite tree for reforestation and woodlot planting
 in this Region. Included in the control problem there are 192,435 acres of
 planted white pine (Tables 6 and 7) representing 16.7 percent of the total
 white pine listed for protection. The actual acreage of planted white pine
 is larger than this, because small plantings are not included in the control
 area. The division into natural and planted white pine acreage is tabulated
 below by States:

Classification of White Pine into Natural and Planted Acreages by States, 1942

State	White Pine Acreage			Percent Planted
	Natural	Planted	Total	
Illinois	231	3,277	3,508	93.4
Indiana	391	7,520	7,911	95.1
Iowa	533	4,467	5,000	89.3
Michigan	362,045	79,869	441,914	18.1
Minnesota	255,518	27,290	282,808	9.6
Ohio	3,236	32,477	35,713	90.9
Wisconsin	339,025	37,535	376,560	10.0
Region	960,979	192,435	1,153,414	16.7

About 91 percent of the white pine acreage in the four States, Ohio,
 Indiana, Illinois, and Iowa, has been planted. These States contain only
 0.4 percent of the total natural white pine, compared with 24.8 percent of
 the total planted pine in the Region. These facts indicate, not only a
 high regard for white pine, but also its wide range of adaptability to
 growing conditions.

Ownership of White Pine

Shown below are figures on classes of ownership of white pine.
 Since ownership is constantly changing these figures are only approximate.

U. S. Forest Service	193,844 acres or 16.8 percent
U. S. Indian Service	50,262 acres or 4.4 percent
Other Public (chiefly State) . . .	291,982 acres or 25.3 percent
Private.	617,326 acres or 53.5 percent
Total	1,153,414 acres or 100.0 percent

The above percentages have not changed materially from those shown
 in the 1942 Report.

Survey Work and Checking

There are three general types of surveys similar in performance, but differentiated according to the status of control. All survey work is for the purpose of systematically mapping an area and obtaining information on white pine and ribes conditions, sufficient to prepare a plan of control work and estimate of man-days required. The three types of surveys are defined as follows:

1. Pre-eradication survey. This is the initial survey prior to deciding upon, or performing initial local control.
2. Resurvey. This is performed, also prior to initial eradication, where conditions have changed, and the original pre-eradication survey data are known to be inaccurate, or more data are needed.
3. Post-check. This survey is performed on areas worked several years previously. On the basis of the post-check, pine areas are listed as needing re-eradication, thrown out because of insufficient pine values, or placed on maintenance.

Survey Work

The real significance of data shown in Table 1 is its application to the permanent records in reducing or increasing the total control problem. The effect of survey work in 1943 is seen in the status of control, Tables 6 and 7.

As seen in Table 1, a considerable amount of pre-eradication survey and post-check was performed, chiefly in Michigan and Wisconsin. In no State was there found an increase in the control areas as a result of surveys. Largely through resurvey and post-check, there was a loss in our permanent records of approximately 12,000 acres of white pine and 39,000 acres of control area. These acreages were discarded for a number of reasons, such as, incorrect original survey, pine values no longer present, failure of plantations, original protection zones too wide, too many ribes to justify costs, etc.

Checking

This activity, while a type of survey, is treated separately. Checking is the systematic evaluation of ribes eradication the same year the work is done to determine if acceptable ribes eradication work has been performed, or if the whole or certain portions of a given area need rework. If the check shows portions of an area with ribes live-stem averaging substantially more than 25 feet of live-stem per acre, those portions should be reworked.

The results of checking upon ribes eradication work in 1943 are shown by States in Table 4, and by ownership classes in Table 4A. Note that ribes were counted on 1,370.66 strip acres. An acre of sample in checking

represents a strip 50 chains long and one-fifth chain wide. Since there are 80 chains in a mile, it is evident that the work of checking in 1943 required the covering of nearly 857 miles of strip.

Good ribes eradication work was done in 1943, as shown by Tables 4 and 4A. Of the 87,101 acres worked and checked, 86,247 acres, or 99.0 percent showed less than 25 F.L.S. and 94.5 percent less than 15 F.L.S. per acre after eradication. The average for all checking was 1.7 bushes and 3.9 F.L.S. per acre.

Local Control Accomplishment

A more detailed discussion of local control accomplishments on the basis of ownership classes is given in the sections devoted to control work on State and private lands, Work Project BLR-3; control work on National Forests, Project BLR-4; and control work on Indian Reservations, Project BLR-7. The discussions following will pertain to the work as a whole.

Local Control in 1943

In Tables 2, 2A, and 3, local control work performed in 1943 is shown classified by States and work agencies, States and ownership classes, and ownership classes and work agencies. For the first time since Emergency Relief funds were made available in 1933, practically all of the local control work done in 1943 was performed on Regular funds.

Considering both initial and re-eradication work there were 42,518 acres of white pine protected by removing 2,061,192 ribes from 109,219 acres of control area at a cost of 15,490 man-days. Over one-half of the acreage worked was re-eradication.

The amount of acreage covered in 1943, while it was the smallest since the work started on a large scale in 1933, nevertheless, represented the largest acreage covered in any year in this Region using State and Regular funds alone.

Due to war conditions and the need for men in the military forces and defense agencies, very careful consideration was given to obtaining the utmost in terms of pine protection, from labor expended. Furthermore, great care was taken that labor employed on ribes eradication should not be recruited in competition with farming, lumbering, or war defense activities. To avoid this criticism, ribes eradication workers were recruited mainly from high schools, over-age local inhabitants, and Indian women. A discussion concerning labor used in 1943 is given earlier in this report.

Ribes eradication in 1943 was performed with labor provided by Regular-Cooperative funds on State and private lands; by Forest Service-Regular 3104 funds in Michigan, Minnesota and Wisconsin; by Indian Service-Regular 3107 funds, and Tribal funds on Indian Reservations in Minnesota and Wisconsin; and by Civilian Public Service Camps in Michigan and Ohio.

The largest acreage and the largest number of man-days were employed on State and private lands using Regular-Cooperative funds. The next largest acreage was covered by men employed on Forest Service-Regular funds.

Michigan led the States in the amount of acreage cleared of ribes, followed closely by Wisconsin, with Minnesota third. However, the largest number of ribes was destroyed and the greatest number of man-days was employed in Wisconsin, followed closely by Minnesota, with Michigan third in these respects. Particularly in Minnesota, the general abundance of ribes on areas worked on the Superior National Forest accounted both for the high number of ribes pulled and of man-days used. The work done in Minnesota was probably the most pressing since blister rust is extremely active in the north portion, and in spite of all efforts is yearly killing tens of thousands of young white pines. These pines cannot be protected in time because of the enormity of the job and the inadequacy of funds and labor to do the necessary control work. Particularly in northeastern Minnesota, careful attention was given to performing ribes eradication on as large contiguous blocks of good white pine as possible which were most in immediate need of ribes eradication. This was done in order to forestall inevitable losses which would have occurred in these stands had not ribes eradication work been performed.

Chemical Eradication

For the first time in this Region, chemicals to kill ribes were generally used. Following recommendations by Mr. Offord, a 50-50 mixture of dry salt and borax was applied to ribes crowns lodged in rocks or imbedded deeply in the soil. Dosages of two ounces for small crowns and four ounces or more for large crowns were applied to the remnants of crowns left in the soil.

Ribes species most troublesome to eradicate by pulling include R. americanum, R. missouriense, and R. aureum. R. americanum is a prolific sprouter. When growing in upland sites it is difficult to pull, because its roots are deeply imbedded. R. missouriense growing in open pastures often grows into a large, compact bush held in place firmly by sod, and is very difficult to pull. R. aureum (or R. odoratum) is the one species apparently able to produce sprouts from roots.

Several hundred pounds of these chemicals were applied to crowns in 1949. In some instances, the chemicals were spread around the base of the parent bush to discourage or prevent the germination and growth from seed. Chemicals were applied in late fall to crowns of R. missouriense in frozen ground in Illinois. Examinations of these various treatments next season will show the degree of killing effected.

Some of our field supervisors mentioned the beneficial effect which chemical treatments of ribes had on the morale of the eradication crews. This operation focused attention on the importance of getting out, or, of killing by chemicals, all ribes crowns.

Status of Control

The present status of control by States and ownership classes is given in Tables 6 and 7. On December 31, 1943, the status of control by States including all ownerships is shown in the following tables:

State	Control Area	Percent	
		Initially Worked	On Maintenance
Illinois	28,441	52.0	4.9
Indiana	137,599	53.7	24.1
Iowa	60,000	57.9	18.0
Michigan	1,345,185	83.4	20.9
Minnesota	643,296	60.0	12.9
Ohio	448,822	41.2	12.0
Wisconsin	1,385,448	67.9	6.8
Region Total	4,046,791	68.1	13.0

It is apparent that there is still a great deal of work to be done before the white pine worth protecting is all on a maintenance basis. While over two-thirds of the control area has been initially worked, only 13 percent is on a maintenance basis. Thus not only is there need for performing initial eradication on approximately 32 percent of the areas, but approximately 55 percent of that already initially worked has to be examined and possibly reworked before it is on maintenance.

From the above table it appears that Michigan, with 83 percent of its control area initially worked and 21 percent on maintenance, is the farthest advanced of all the States toward the goal of having control accomplished around all worthwhile stands. While 24 percent of the control area in Indiana and 13 percent in Ohio are shown as being on maintenance it is probable that a much higher percent can be placed on maintenance in these States when it is possible to adequately examine white pine areas in their southern portions where ribes are relatively scarce or absent.

In the northern part of the three Lake States, especially in northeastern Minnesota, where on many sites white pine is the best possible crop to grow, the favorable seasons since 1937 have very markedly increased the germination and growth of white pine reproduction. This increase in the number of young white pine trees has not only extended the known limits of white pine areas but has also materially tended to increase the stocking of these trees in existing white pine stands.

Unfortunately, however, the conditions favorable to white pine reproduction have also been favorable to rust spread and development. The net result is that in unprotected stands the rust is killing young white pines at a very much greater rate than they are coming in through natural regeneration.

During these war years when funds for blister rust control and labor are scarce, our only sound approach to the problem is to protect the very cream of the crop and to make our funds go as far as possible in saving the greatest number of white pine trees. In so doing, however, it is inevitable that millions of young white pines on tens of thousands of acres will be killed. It is hoped that in the post-war period, funds and labor will be

CHART 1

Changes from of control areas in maintenance
initially worked but not on maintenance and
worked by State for North Central Region
to December 31, 1943

Based on Tables No. 4 and 5

Areas in Control Areas

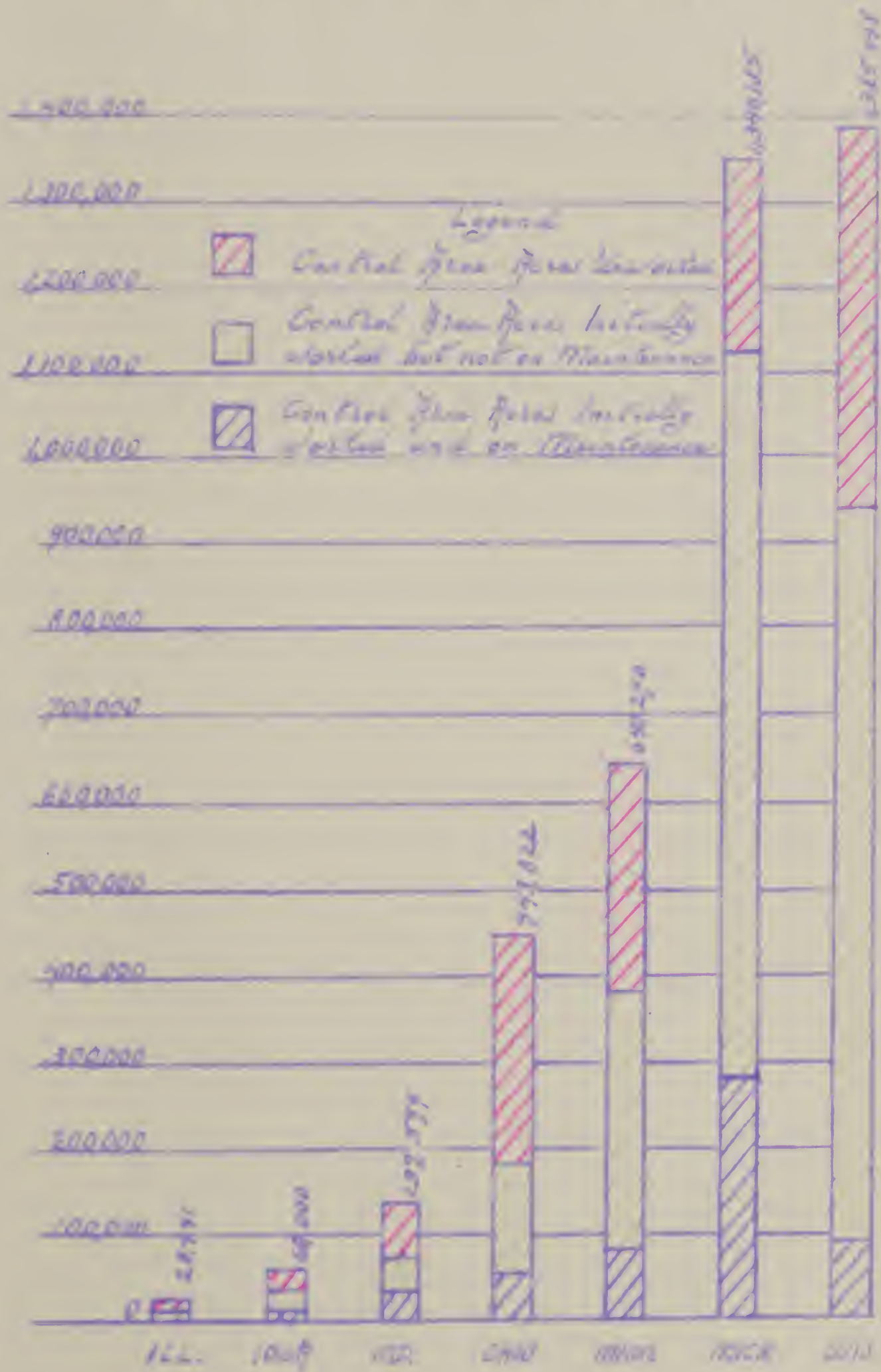
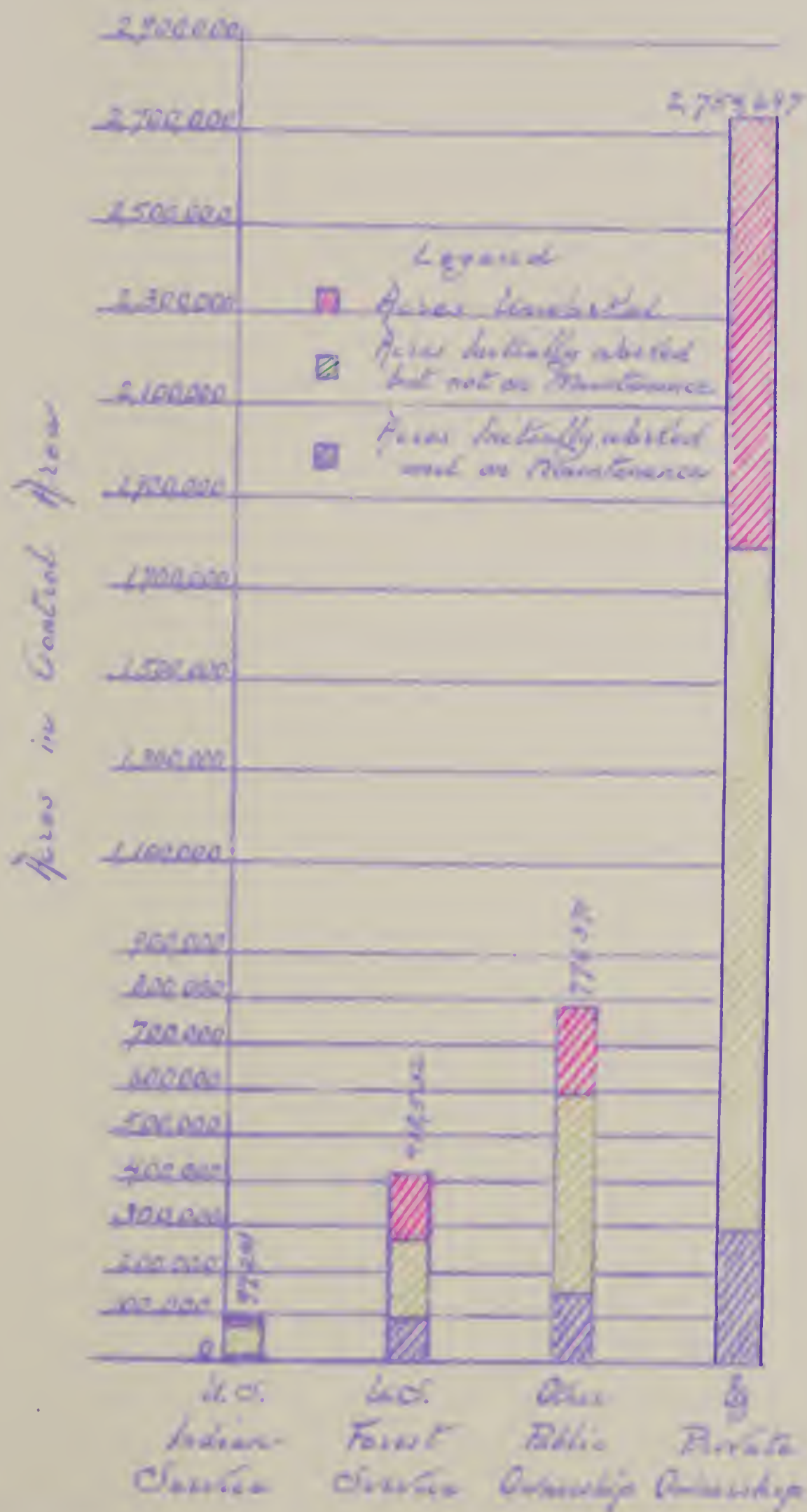


CHART 2

Analysis of Area of Control Area, On Maintenance, Actually
Worked but not on Maintenance and Construction, by Owner-
ship Classes for North Central Region to December 31, 1941
Based on Tables No. 6 and 7



made available so that this destruction of young white pines can be greatly lessened if not halted, and that white pine sites may be permanently cleared of ribes, thus allowing future generations of white pines to grow undamaged in blister rust invaded areas.

As blister rust control workers we must look farther than saving the existing white pine crop. We must remember that the presence of ribes on a good white pine site destroys not only the existing stand but prevents indefinitely the production of future white pine forests. Thousands of acres in the northern part of the three Lake States would be best utilized if they were in white pine production. Therefore, as funds and labor permit, the protection of such white pine sites must be taken into consideration in blister rust control plans.

Nursery Sanitation

Work Done 1943

There were 27 nurseries given sanitation workings during 1943. According to ownership, 13 were private, 1 was county, 10 were State, 1, Soil Conservation Service, and 2, Forest Service. There were 21,862 ribes removed from 10,016 acres of control area at a cost of 304 man-days. This work provided protection for approximately 19,050,700 white pine trees. In protecting nurseries against blister rust, the full 1500-foot protection zone for all ribes and one-mile wide zone for cultivated black currants are maintained. The reason for this additional protection width is because nursery stock is often grown under overhead watering systems which create more or less optimum infection conditions. In order to maintain ribes-free conditions and to insure so far as possible the production of rust-free white pine planting stock, periodic workings of white pine growing nurseries are performed at least every two years. At the present time, practically all of our white pine producing nurseries, except a few private nurseries, have been protected, and the problem involves chiefly the maintenance of this protection work. Nursery sanitation performed in 1943 is shown in Table 9.

Present Status of Nursery Sanitation

The following table, taken from Omnibus Table 5A, Sheet 1, shows the present status of nursery sanitation in this Region.

State	Number of Nurseries		Number Acres Worked		Total Acres
	Sanitation Zone	Sanitation Zone	Sanitation Zone	Sanitation Zone	
	Maintained	Abandoned	Maintained	Abandoned	
Illinois	8	-	4,330	-	4,330
Indiana	3	3	1,650	2,100	3,750
Iowa	7	2	2,156	910	3,066
Michigan	9	4	2,524	2,162	4,686
Minnesota	9	8	3,919	1,886	5,804
Ohio	6	9	1,631	4,507	6,131
Wisconsin	11	6	2,760	2,225	4,985
Region Total	51	32	18,962	13,790	32,752

The most usual reasons for not maintaining nursery sanitation zones around white pine producing nurseries are that such nurseries discontinued the growing of white pine, or the prevalence of ribes made the sanitation work too costly to maintain. Of the 51 nurseries still maintaining sanitation zones, 27 were checked for ribes in 1943. It is probable that of the remaining 24 nurseries some are permanently ribes-free, and the others will be checked in 1944. Now that sanitation conditions are fairly well established around white pine growing nurseries, a check for ribes every other year is usually sufficient.

Control Area Permits

As defined in Federal Quarantine 63, the States of Michigan, Minnesota, Ohio and Wisconsin are White Pine Control Area States. The interstate movement of ribes into designated control areas within these States can only be done if each ribes shipment carries a control area permit issued by the proper State Plant Quarantine Officer. The issuing of control area permits is a function of the State which has been carried on for several years. Previous to 1943, however, no record on this activity has been made in our Annual Reports.

Procedure in Issuing Control Area Permits

Illinois

Although Illinois is not classified in Quarantine 63 as a control area State, nevertheless, a blister rust regulation, effective June 1, 1939, has been promulgated by the State Director of Agriculture. Control areas have been established within 900 feet of all valuable white pine stands and within 1,500 feet of white pine growing nurseries. The destruction of R. nigrum within one mile of all such control areas, and of all other ribes within distances designated has been ordered. All control areas have to be mapped and described and on file with the Chief Plant Inspector of the Division of Plant Industry.

While Transit Inspectors of the Division of Domestic Plant Quarantines do not turn back shipments of ribes destined for points in Illinois, they notify the Illinois Chief Plant Inspector of the names and addresses of such consignees. This enables the Chief Plant Inspector to determine whether or not such ribes are destined for control areas.

Michigan

Although Michigan has been designated as a control area State in Federal Quarantine 63, and the State Commissioner of Agriculture is authorized to order the establishment of (1) - white pine blister rust control areas, and (2) - fruiting carrant and gooseberry areas, no such order has been officially issued. Control area permits have been required for ribes shipments from out-of-State nurseries, but there has been no control of ribes shipments entirely within the State.

To remedy this situation the following general plan has been devised:

1. The general blister rust control area will consist of a list of post offices and rural routes designated as being within the white pine portion of the State. This list will be based on the combined judgments of men most experienced in the subject. Cities of over 20,000 population, and non-pine growing portions (especially southeastern Michigan) will be excluded.
2. This mimeographed list will be supplied to all nurserymen within the State, to important out-of-State nurseries shipping ribes, and to Transit Inspectors.
3. To ship ribes into the control area from either within-State or out-of-State nurseries a ribes shipping permit issued by the State Department of Agriculture is required.
4. To determine if a proposed ribes shipment into the designated control area can safely be made, the State Department of Agriculture will refer to records and maps at hand, or, if necessary, will write the consignee to find out if the ribes are destined to a point within 900 feet of valuable white pine stands.
5. Within-State nurseries will be issued green warning tags to be attached to each ribes shipment, similar to those issued in Wisconsin, making it the responsibility of the buyer of ribes plants not to plant them close to white pines.
6. Within-State nurseries (and possibly out-of-State nurseries) may ship ribes to points in Michigan outside the control area without permit tags.

Minnesota

1. Permits to plant ribes in control areas issued by the Department of Conservation.
2. Work of issuing permits carried out by blister rust control State Leader for the Commissioner of Conservation.
3. Upon application from out-of-State nurseries for permission to ship ribes into Minnesota, such nurseries are sent general control area permits, and map showing control areas. When shipping, nursery attaches one tag to package, and sends one duplicate to State Leader's office. In the application the shipper promises not to ship ribes into the control area portion of the State. The duplicate tag is an added check on this point.
4. Special shipping permits for ribes originating either without or in the State required for shipment into control area. To do this the shipper writes to the State Leader's office.
5. Upon receipt the State Leader writes to prospective buyer, sending him mimeographed literature on control areas, and asking for detailed information as to where ribes are to be planted.

6. When the reply is received the description is checked against the county map showing pine areas. If the shipment is not destined for a specific control area, a planting permit is issued to the nursery desiring to make the shipment.
7. If the destination is within a control area, both the shipper and consignee are notified that the shipment cannot be made, and reasons therefore.

Ohio

Issued by: Chief, Division of Plant Industry, Columbus, Ohio.

Control Area: All white pine areas worth protecting, worked or unworked, with protective zone of 900 feet (1,500 feet for nurseries) in width around each area. On file in Plant Industry Office.

Procedure: Blister rust control State Leader furnishes Plant Industry Office with list of control areas and county maps showing their locations. Nurseries, both within and outside State, receiving ribes orders forward them to Plant Industry Office. If destination is plainly indicated on order, and if, after consulting county map, the destination is not within control zone, a permit is issued. Sometimes it is necessary to write to buyer for more exact address.

Wisconsin

1. Processed in State Entomologist's Office.
2. Each Wisconsin nurseryman furnished with copy of General Order No. 3E.
3. Nursery selling ribes within State are furnished with supply of green warning tags, one to be attached to each ribes shipment, warning ribes customers it is unlawful to plant ribes within posted, worked control areas. Within-State nurseries not issued special permit tags.
4. Out-of-State nurseries write State Entomologist for special permits, giving names and addresses of prospective ribes customers.
5. Maps on file in State Entomologist's Office (1) State map showing locations of protected pines as red dots; (2) County maps showing actual locations of protected pine areas; and (3) City maps showing locations of protected pines.
6. Addresses of prospective ribes buyers checked against maps. If destination not within a protected area, permit

is sent nurseryman. If address is inadequate, more explicit location as to township, range and section is requested. If destination is within protected area, nursery is notified that no permit can be issued.

The "green warning tag" referred to as attached to each ribes shipment originating in a Wisconsin nursery and destined for a Wisconsin point is quoted in full following:

"IMPORTANT

Current or gooseberry bushes planted in areas where White Pine Blister Rust is present may aid in the spread of this serious disease of White Pine trees.

"CAUTION

Planting current or gooseberry bushes within 900 feet of a legally posted White Pine stand or within 1500 feet of a protected White Pine nursery is illegal. Such bushes are subject to destruction without compensation. To determine whether a specific pine stand is legally posted or a nursery protected, inquire of the owner or write

State Entomologist
Room No. 9, West, State Capitol,
Madison.

"Official warning tag. Issued pursuant to General Order No. 3E, Department of Agriculture and Markets.

"This tag must be attached to every shipment of current or gooseberry plants moved in Wisconsin."

Control Area Permits Issued in 1943

In Table 5 there is given a summary of work done in 1943 in issuing control area permits. Of the 6,746 applications received, only 40 or 0.6 percent were rejected. Over three times as many applications were received in the spring as in the fall. Due to emphasis on victory gardens, the planting of currants and gooseberries has been greatly increased over former years. Fortunately the great bulk of control areas lies in the less populated northern portions of the three Lake States, where ribes are not so likely to be planted, and where in many cases houses are not involved.

A total of 114 man-days was estimated to have been used in issuing control area permits in the Region. This is not a heavy burden for the entire job. In addition to preventing replanting of ribes within control areas, this procedure is an excellent means of acquainting ribes and white pine owners with the blister rust control program.

Violations of Federal Quarantine 63

As reported by the Division of Domestic Plant Quarantines for the fiscal year 1943, there were violations of Federal Quarantine 63 reported as follows in this Region:

Michigan	12 shipments
Minnesota	8 shipments
Ohio	11 shipments
Wisconsin	7 shipments

These shipments consisted of currants and gooseberries going into control area States without ribes shipping permits.

Cultivated Black Currant Elimination

The only work done in cultivated black currant elimination in 1943 was performed in Indiana, Iowa, and Ohio. Even in these States the work was principally in connection with scouting for the rust in Ohio and as part of local control and post-check work in Indiana and Iowa.

As noted in Table 10, a total of 20 properties containing 99 bushes was found. A total of 286 bushes on 71 properties was destroyed. Most of the bushes destroyed in 1943 had been found previously at a time when they could not be removed for one reason or another.

As noted in Table 11, to December 31, 1943, there have been found 291,743 cultivated black currants on 35,750 properties. Of this total, 284,695 bushes growing on 34,712 properties have been destroyed. Thus, 97.6 percent of all *R. nigrum* bushes known to exist in the pine producing area of this Region has been destroyed. The cultivated black currant elimination program has been virtually completed. This accomplishment represents an important step in reducing the spread and intensification of the rust, especially at new points.

Canker Pruning

A very limited amount of canker pruning was performed in Minnesota and Ohio during 1943. As noted in Table 14, there were 34 infected trees removed and 2,369 cankers destroyed from 438 trees. This work was done in public parks. Only 55 man-days were used on this project. These men were chiefly employed on W.P.A. funds in Minnesota, in January, 1943.

It is contemplated that in the post-war period, banker pruning can be effectively performed on areas previously protected by ribes eradication. This work would not only be done for aesthetic reasons but as an actual control measure to save white pines which would otherwise be killed by the rust.

Informational Activities

During these war times our activities in furnishing information to the general public on blister rust control have been curtailed. Blister rust control exhibits were placed in the State Fairs at Milwaukee, Wisconsin, and at St. Paul, Minnesota. The additional benefits of the issuing of control area permits already have been mentioned. During 1943, extensive use was made of the Eastern Blister Rust Film in all our North Central States. Uniformly the response to this film has been very favorable.

Investigational Work

No annual report on investigational activities will be prepared for 1943. Dr. E. E. Honey, who has been heading up this activity in the Region, was transferred in July, 1943, to the U. S. D. A. Plant Disease Survey Project. In lieu of an annual report, a paper entitled "Outline of Blister Rust Control Investigative Work, North Central Region" was prepared and distributed in typewritten form to interested parties. In it were included a general statement relative to pine, ribes, rust and climatic conditions as they affect the control program, a listing of general problems being studied, progress and results to date, and work recommended for the future.

Two technical memoranda were prepared in the Milwaukee Office during 1943, which were distributed as dittoed reports. These are summarized briefly:

Technical Memorandum No. 1 "Analysis of Ribes Eradication on Areas Worked Twice, Minnesota and Wisconsin"

Data taken at random from permanent records on ribes pulled and man-days used on initial, and on second eradication work over the same areas, were analyzed.

On the basis of studying 75 areas involving nearly 30,000 acres worked twice, the results were decidedly encouraging. On initial working, an average of 150.0 ribes per acre was removed, while on second working 37.6 ribes, or less than one-quarter of the number on initial eradication, were destroyed. The time elapsing between eradications varied from two to six years, with the majority between four and five years. No significant differences in numbers of ribes pulled because of time intervals between workings were apparent.

The average number of man-days per acre in initial working was 0.39, against 0.19 man-day used in second working, or less than half that used initially.

These figures indicate that progress is being made towards the permanent suppression of ribes on control areas in this Region.

Technical Memorandum No. 2 "Study of Blister Rust Infection on Pinus peuce, P. koraiensis, P. strobus, and P. monticola at the Cloquet Forest Experiment Station, Cloquet, Minnesota."

1. A study was made in June and July, 1943, at the Cloquet Forest Experiment Station, Minnesota, of blister rust infection on four species of pine, namely: Pinus peuce, P. koraiensis, P. strobus and P. monticola. These were growing at two locations, the Nursery and the Arboretum.

2. Listed in decreasing order of severity of infection the four species are: P. monticola, 71.9 percent; P. peuce, 39.2 percent; P. strobus, 14.4 percent; and P. koraiensis, 0.0 percent. The unusual feature was the apparent high susceptibility of P. peuce, and the fact that no infection was found on P. koraiensis.

3. The only ribes involved within 1,200 feet of either the Nursery or Arboretum were R. glandulosum, R. hirtellum and R. triste confined to swamps. No ribes were found in the jack pine upland types, which, with the swamps, made up the entire protection zone. There was much more pine infection on the same species in the Nursery, with ribes distant and scarce, than in the Arboretum with ribes close and abundant. P. peuce in the nursery, 900 feet from ribes showed 49.5 percent infection. Those in the Arboretum, within 250 feet of ribes, showed only 11.8 percent infection. Similarly in the Nursery there were 15.3 percent of P. strobus trees affected, 600 feet from ribes, contrasting with 11.4 percent infection in the Arboretum within 50 feet of ribes.

4. Weather conditions were peculiarly favorable for pine infection at Cloquet. During the period 1934 to 1942, the average monthly rainfall during August was 3.68 inches and in September 2.71 inches. Average temperature was 65.7° F. in August, and 55.9° F. in September.

5. The Cloquet pine infection represents the only example in the North Central Region of an apparent spread of rust from swamp ribes to pines for over 900 feet. It is believed optimum weather conditions and lack of screening at the Nursery were largely responsible. This one example is insufficient to counteract the many examples of lack of spread of rust from swamp ribes to nearby pines. No recommendation is made for the general widening of swamp type zones beyond the established 100 feet.

Other studies being written include a paper on the status of blister rust control in northeastern Minnesota, and a paper to be issued jointly by this office and the Lake States Forest Experiment Station on the relation of blister rust control to white pine management in the Lake States. Data pertaining to blister rust control for both of these papers are on hand in the Milwaukee Office.

Costs

In Tables 12 and 12A, cost figures for the calendar year 1943 are shown by States and activities, and by agencies and activities, respectively. A total of \$209,460.25 was spent on the general control program.

Of this total, approximately 59 percent was spent on field activities directly concerned with the protection of white pine stands by the removal of ribes. The activities entitled "Supervision" against which 41.1 percent of the cost is charged, is misleading. Under this heading are included costs of our permanent skeleton organization, including the Milwaukee Office, State and District Leaders, and to a lesser extent, members of the Milwaukee Regional Office were concerned with all field activities, including ribes eradication. For bookkeeping purposes, however, these costs are shown under "Supervision." A more descriptive title would be "State and District Leaders' activities." The skeleton organization remains practically the same whether a large program of emergency funds is administered or whether there is only a small amount of money for local control. Thus, the proportion of this item to the total is much higher during those years when labor funds are small than it is during the years of large emergency programs. Also during 1943 a much higher proportion of the time of State and District Leaders was spent in doing recovery and post-check work and, in general, making plans for the most effective use possible of ribes eradication funds.

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATE LANDS IN THE
NORTH CENTRAL REGION, 1943. WORK PROJECT BLR-3-3

Objective of Cooperative Project

The purpose of this cooperative project is to control white pine blister rust on all non-Federal lands, both public and private. Non-Federal public and private funds are matched by Regular Federal funds insofar as appropriations are available. These funds are administered cooperatively by the Bureau of Entomology and Plant Quarantine and State agencies concerned and are spent entirely for local control on State and private lands in the seven North Central States.

Cooperative Expenditures in 1943

During 1943, \$22,038.63 were spent by State and private cooperators, including States, Counties, municipalities and individuals, on the protection of white pine against blister rust. Matching these funds the Bureau of Entomology and Plant Quarantine spent a total of \$27,756.43, including \$24,882.42 of 3103 funds and \$2,874.01 of 3101 funds. Thus, a total of \$49,795.06 was spent on local control on State and private lands in this Region. This information is shown in Text Table 5.

Control Accomplishments, 1943

In Text Table 1, local control accomplished on these Regular-Cooperative funds on State and private lands is shown. It will be noted that under initial and re-eradication, 23,135 acres of white pine were given protection by the removal of 678,576 ribes from 76,653 acres of control area at a cost of 5,671 man-days.

Of the total acreage worked, 40,289 acres were re-eradication and 36,364 initial. In selecting areas for work, careful thought was given to see to it that ribes eradication was performed only on those areas of young white pine of the greatest value and in most immediate need of control work, irrespective of whether the work was initial or re-eradication.

The contribution toward this work on the part of the Bureau of Entomology and Plant Quarantine consisted almost entirely of paying for labor. State and cooperative funds were used in the employment of labor, supervisors, the assignment of State and County men to control work, the employment of owners of white pines, etc. To a greater or less degree, owners contributed toward the protection of their own stands in all of the States. Examples of other types of cooperation on the part of States may be given. In Ohio, an owner of several thousand acres of waste land paid the full wages of an eradication crew formerly employed on Regular

funds for the ribes eradication around his numerous white pine plantings. The Huron Mountain Club in northern Michigan contributed \$1,000 for the employment of labor, matched by an equal amount from the Federal Government for the protection of pine stands on the Huron Mountain Club property. In Wisconsin, several counties used County Forest Crop Law funds for the employment of ribes eradication labor on county forests. In Minnesota, a camp was established made up of high school boys employed on 3103 funds, and State Forest Rangers, for ribes eradication on the Cloquet Valley State Forest.

In Text Table 3, all work done on State and private lands by all agencies in 1943 is shown. This differs from Text Table 1 only by the addition of a small amount of work done by the Civilian Public Service Camp in Ohio. (This work amounted to the protection of 210 acres of planted pine on State lands by the removal of 10,271 ribes from 870 acres of control area at a cost of 188 man-days of C.P.S. labor).

Status of Control

In order that a complete record may be available for all work done under the Regular-Cooperative program, Text Table 2 has been devised to show all work since inception in 1941 through 1943.

The status of control on State and private lands in this Region as of December 31, 1943, is shown in Text Table 4. The total control problem includes 3,531,018 acres. Of this total, 2,408,947 acres or 68 percent have been given initial protection and 451,976 acres or practically 13 percent are on maintenance. Thus, while progress has been made in the protection of State and privately-owned white pine, there remains a great amount of work to be done before all control work is accomplished, and such stands are in a state of maintenance.

Text Table 1. Summary of Local Control on State and Private Lands,
North Central Region, 1943, Regular-Cooperative, RLP-3

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Pulled	Man-days Used
		Natural	Planted	Total			
Initial Eradication							
Illinois	Private	-	131	131	723	46,565	189
Indiana	Private	-	157	157	1,522	29,414	112
Iowa	Non-fed. Public	4	-	4	44	6,967	46
	Private	-	26	26	220	6,587	57
	Total	4	26	30	264	13,554	103
Michigan	Non-fed. Public	808	370	1,178	3,593	13,235	54
	Private	1,735	1,097	2,832	13,990	73,058	618
	Total	2,543	1,467	4,010	17,583	86,293	672
Minnesota	Non-fed. Public	135	-	135	234	5,025	265
Ohio	Non-fed. Public	-	10	10	400	2,913	44
	Private	-	413	413	2,603	26,766	211
	Total	-	423	423	3,003	29,679	255
Wisconsin	Non-fed. Public	1,544	506	2,050	4,132	29,170	236
	Private	2,897	152	3,049	8,903	82,725	637
	Total	4,441	658	5,099	13,035	111,895	873
Region	Non-fed. Public	2,491	886	3,377	8,403	57,380	645
	Private	4,632	1,988	6,620	27,961	264,115	1,824
Total		7,123	2,874	9,997	36,394	322,445	2,669
Re-eradication							
Illinois	Non-fed. Public	92	317	409	1,100	47,170	601
Iowa	Private	-	57	57	513	1,362	103
Michigan	Non-fed. Public	988	476	1,464	4,180	24,959	127
	Private	2,947	518	3,465	11,594	116,518	798
	Total	3,935	994	4,929	15,774	141,477	925
Minnesota	Non-fed. Public	567	-	567	788	28,131	485
	Private	-	2	2	33	510	2
	Total	567	2	569	821	28,641	487
Ohio	Non-fed. Public	-	534	534	3,528	2	7
	Private	-	54	54	184	500	4
	Total	-	588	588	3,712	502	11
Wisconsin	Non-fed. Public	484	426	910	2,814	12,931	220
	Private	5,508	168	5,676	15,255	81,177	850
	Total	5,992	594	6,586	18,069	94,108	1,070
Region	Non-fed. Public	2,131	1,753	3,884	12,710	153,493	1,440
	Private	8,455	799	9,254	27,579	203,588	1,762
Total		10,586	2,552	13,138	40,289	357,081	3,202

(Cont'd)

Text Table 1. (Cont'd) Summary of Local Control on State and Private Lands,
North Central Region, 1943, Regular-Cooperative, BLR-3

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Pulled	Man- days Used
		Natural	Planted	Total			
		Initial and Re-eradication					
Illinois	Non-fed. Public	92	317	409	1,400	87,470	601
	Private	-	133	133	723	46,565	189
	Total	92	450	542	2,123	134,035	790
Indiana	Private	-	167	167	1,532	20,414	112
Iowa	Non-fed. Public	4	-	4	44	6,967	46
	Private	-	83	83	733	11,470	165
	Total	4	83	87	777	18,437	211
Michigan	Non-fed. Public	1,796	846	2,642	7,773	38,194	181
	Private	4,682	1,615	6,297	25,584	189,576	1,416
	Total	6,478	2,461	8,939	33,357	227,770	1,597
Minnesota	Non-fed. Public	702	-	702	1,022	33,226	750
	Private	-	2	2	33	510	2
	Total	702	2	704	1,055	33,736	752
Ohio	Non-fed. Public	-	544	544	3,928	2,915	51
	Private	-	467	467	2,787	21,266	215
	Total	-	1,011	1,011	6,715	24,181	266
Wisconsin	Non-fed. Public	2,028	932	2,960	6,946	42,101	456
	Private	8,405	320	8,725	24,158	163,902	1,487
	Total	10,433	1,252	11,685	31,104	206,003	1,943
Region	Non-fed. Public	4,622	2,639	7,261	21,113	210,873	2,085
	Private	13,087	2,787	15,874	55,540	467,703	3,586
Total		17,709	5,426	23,135	76,653	678,576	5,671

Test Table 2. Cumulative Summary of Local Control on State and Private Lands,
North Central Region, Regular-Cooperative Funds, 1941-1943

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Pulled	Man-days Used
		Natural	Planted	Total			
		Initial Eradication					
Illinois	Non-fed. Public	-	11	11	379	1,851	17
	Private	-	236	236	2,740	103,790	294
	Total	-	247	247	3,119	105,641	311
Indiana	Non-fed. Public	-	9	9	734	2,202	20
	Private	-	528	528	7,175	42,419	237
	Total	-	537	537	7,909	44,621	257
Iowa	Non-fed. Public	4	-	4	144	6,967	46
	Private	-	84	84	928	21,106	401
	Total	4	84	88	1,072	28,073	447
Michigan	Non-fed. Public	1,999	1,368	3,367	12,447	94,347	457
	Private	7,117	2,347	9,464	41,846	273,106	1,608
	Total	9,116	3,715	12,831	54,293	367,453	2,065
Minnesota	Non-fed. Public	307	-	307	485	21,388	570
	Private	-	2	2	33	2,000	4
	Total	307	2	309	518	23,388	574
Ohio	Non-fed. Public	-	823	823	3,100	17,027	452
	Private	127	1,745	1,872	13,623	27,399	262
	Total	127	2,568	2,695	16,723	44,426	714
Wisconsin	Non-fed. Public	4,115	3,140	7,255	18,278	68,231	751
	Private	4,504	882	5,386	24,852	247,508	1,303
	Total	8,619	4,022	12,641	43,130	315,739	2,054
Region	Non-fed. Public	6,425	5,351	11,776	35,467	212,013	2,313
	Private	11,746	5,824	17,572	91,197	717,328	4,109
Total		18,173	11,175	29,348	126,664	929,341	6,422
		Re-eradication					
Illinois	Non-fed. Public	92	815	907	3,198	135,878	832
	Private	-	146	146	565	7,158	77
	Total	92	961	1,053	3,763	143,036	909
Indiana	Non-fed. Public	-	363	363	2,070	11,767	144
Iowa	Private	-	82	82	772	7,251	194
Michigan	Non-fed. Public	5,228	590	5,818	11,064	59,179	428
	Private	5,393	998	6,391	21,443	165,649	1,197
	Total	10,621	1,588	12,209	32,507	224,828	1,625
Minnesota	Non-fed. Public	1,232	243	1,475	2,169	81,280	1,102
	Private	-	2	2	33	510	2
	Total	1,232	245	1,477	2,202	81,790	1,104
Ohio	Non-fed. Public	-	552	552	3,577	2	7
	Private	-	101	101	798	541	8
	Total	-	653	653	4,375	543	15
Wisconsin	Non-fed. Public	7,442	1,811	9,253	18,052	136,359	1,050
	Private	11,283	584	11,867	43,133	115,769	1,348
	Total	18,725	2,395	21,120	61,185	252,128	2,398
Region	Non-fed. Public	13,994	4,374	18,368	40,130	424,465	3,563
	Private	16,676	1,917	18,593	66,751	297,378	2,826
Total		30,670	6,291	36,961	106,881	721,843	6,389

Text Table 2. (Cont'd) Cumulative Summary of Local Control on State and Private Lands, North Central Region, Regular-Cooperative Funds, 1941-1943

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Pulled	Man-days Used
		Natural	Planted	Total			
Initial and Re-eradication							
Illinois	Non-fed. Public	92	826	918	3,577	137,729	849
	Private	-	382	382	3,305	110,948	371
	Total	92	1,208	1,300	6,882	248,677	1,220
Indiana	Non-fed. Public	-	372	372	2,804	13,969	164
	Private	-	528	528	7,175	42,419	237
	Total	-	900	900	9,979	56,388	401
Iowa	Non-fed. Public	4	-	4	44	6,967	46
	Private	-	170	170	1,707	28,857	595
	Total	4	170	174	1,751	35,824	641
Michigan	Non-fed. Public	7,227	1,958	9,185	23,511	153,526	885
	Private	12,510	3,345	15,855	63,289	438,755	2,805
	Total	19,737	5,303	25,040	86,800	592,281	3,690
Minnesota	Non-fed. Public	1,539	243	1,782	2,654	102,668	1,672
	Private	-	4	4	66	2,510	6
	Total	1,539	247	1,786	2,720	105,178	1,678
Ohio	Non-fed. Public	-	1,375	1,375	6,677	17,029	459
	Private	127	1,846	1,973	14,421	27,940	270
	Total	127	3,221	3,348	21,098	44,969	729
Wisconsin	Non-fed. Public	11,557	4,951	16,508	36,330	204,590	1,801
	Private	15,787	1,466	17,253	67,985	363,277	2,651
	Total	27,344	6,417	33,761	104,315	567,867	4,452
Region	Non-fed. Public	20,419	9,725	30,144	75,597	636,478	5,876
	Private	28,424	7,741	36,165	157,948	1,014,706	6,935
Total		48,843	17,466	66,309	233,545	1,651,184	12,811

Text Table 5. Summary of Local Control on State and Private Lands,
North Central Region, All Agencies, 1943

State	Ownership Class	Acres W. P. Protected		Acres Worked	Ribes Pulled	8-Hour Man-days Used
		Natural	Planted			
Initial Eradication						
Ohio	Non-fed. Public	-	220	220	1,270	232
	Private	-	413	413	2,603	211
	Total	-	633	633	3,873	443
All States Except Ohio	Non-fed. Public	2,491	876	3,367	8,003	601
	Private	4,632	1,575	6,207	25,358	1,613
	Total	7,123	2,451	9,574	33,361	2,214
Region	Non-fed. Public	2,491	1,096	3,587	9,273	833
	Private	4,632	1,988	6,620	27,961	1,824
Total		7,123	3,084	10,207	37,234	2,657
Re-eradication						
Ohio	Non-fed. Public	-	534	534	3,528	7
	Private	-	54	54	184	4
	Total	-	588	588	3,712	11
All States Except Ohio	Non-fed. Public	2,131	1,219	3,350	9,182	1,433
	Private	8,455	745	9,200	27,395	1,758
	Total	10,586	1,964	12,550	36,577	3,191
Region	Non-fed. Public	2,131	1,753	3,884	12,710	1,440
	Private	8,455	799	9,254	27,579	1,762
Total		10,586	2,552	13,138	40,289	3,202
Initial and Re-eradication						
Ohio	Non-fed. Public	-	754	754	4,798	239
	Private	-	467	467	2,787	215
	Total	-	1,221	1,221	7,585	454
All States Except Ohio	Non-fed. Public	4,622	2,095	6,717	17,185	2,034
	Private	13,087	2,320	15,407	52,753	3,371
	Total	17,709	4,415	22,124	69,938	5,405
Region	Non-fed. Public	4,622	2,849	7,471	21,983	2,273
	Private	13,087	2,787	15,874	55,540	3,586
Total		17,709	5,636	23,345	77,523	5,859

Note: The only agency, other than Regular-Cooperative, BIR-3, performing ribes eradication on state and private lands in 1943 was C.P.S. in Ohio, under which 210 acres of planted pine on state land were protected initially by removing 10,271 ribes from 870 acres at a cost of 188 C.P.S. man-days. Detailed figures for "all states except Ohio" are shown in Text Table 1.

Text Table 4. Status of Control on Non-federal Public and Private Lands,
North Central Region, December 31, 1943

Ownership Class	Total Control Problem, Net Acres				Net Acres Initially Worked				Net Acres Not Initially Worked		Net Acres on Maintenance	
	Total		Total		Total		Total		White		White	
	Natural W. P.	Planted W. P.	Natural W. P.	Control Area	Natural W. P.	Planted W. P.	Natural W. P.	Control Area	White Pine	Control Area	White Pine	Control Area
Illinois												
Non-fed. Pub.	198	2,139	2,337	10,192	193	2,054	2,247	8,941	90	1,251	520	728
Private	33	1,138	1,171	18,249	33	804	837	5,849	334	12,400	30	650
Total	231	3,277	3,508	28,441	226	2,858	3,084	14,790	424	13,651	550	1,378
Indiana												
Non-fed. Pub.	99	1,956	2,055	18,080	66	1,817	1,883	16,478	172	1,602	418	4,362
Private	292	5,494	5,786	119,128	292	3,799	4,091	57,450	1,695	61,678	1,872	28,767
Total	391	7,450	7,841	137,208	358	5,616	5,974	73,928	1,867	63,280	2,291	33,129
Iowa												
Non-fed. Pub.	189	96	285	2,245	171	59	230	1,579	55	666	1	3
Private	344	4,326	4,670	57,255	229	2,303	2,532	32,950	2,138	24,305	679	10,771
Total	533	4,422	4,955	59,500	400	2,362	2,762	34,529	2,193	24,971	680	10,774
Michigan												
Non-fed. Pub.	107,664	36,189	143,853	337,794	96,728	34,052	130,780	305,024	13,073	32,770	45,457	102,087
Private	235,384	11,351	246,735	867,047	188,652	9,339	197,991	689,031	48,744	178,016	29,107	109,709
Total	343,048	47,540	390,588	1,204,841	285,380	43,391	328,771	994,055	61,817	210,786	74,564	211,796
Minnesota												
Non-fed. Pub.	45,668	15,378	61,046	130,921	28,925	6,064	34,990	72,466	26,056	58,455	8,219	17,097
Private	88,407	439	88,846	277,640	67,134	437	67,571	207,416	21,275	70,224	14,457	34,608
Total	134,075	15,817	149,892	408,561	96,060	6,501	102,561	279,882	47,331	128,679	22,676	51,705
Ohio												
Non-fed. Pub.	31	15,337	15,368	93,875	29	3,610	3,639	33,160	11,729	60,715	452	4,285
Private	3,205	16,637	19,842	351,201	3,028	7,578	10,606	150,062	9,236	201,139	2,438	48,513
Total	3,236	31,974	35,210	445,076	3,057	11,188	14,245	183,222	20,965	261,854	2,890	52,798
Wisconsin												
Non-fed. Pub.	50,775	16,263	67,038	183,264	45,603	15,434	61,037	161,273	6,001	21,991	10,049	25,544
Private	241,346	8,930	250,276	1,064,127	159,944	5,864	165,808	667,268	84,468	396,859	15,936	64,843
Total	292,121	25,193	317,314	1,247,391	205,547	21,298	226,845	828,541	90,469	418,850	25,985	90,387
Region												
Non-fed. Pub.	204,624	87,358	291,982	776,371	171,716	63,090	234,806	598,921	57,176	177,450	65,116	154,106
Private	569,011	48,315	617,326	2,754,647	419,312	30,124	449,436	1,810,026	167,890	944,621	64,520	297,870
Total	773,635	135,673	909,308	3,531,018	591,028	93,214	684,242	2,408,947	225,066	1,122,071	129,636	451,976

Text Table 5. Costs of Local Control, Surveys, etc., on State and Private Lands, 1943

States	State and Private Cooperation		Bureau Cooperation		Grand Total
	Cash and Contributed Services	Total	3101	3103	Total
Illinois	85,167.68	85,167.68		83,096.89	85,594.57
Indiana	291.00	291.00		512.03	803.03
Iowa	1,650.95	1,650.95		1,444.81	3,045.76
Michigan	5,627.88	3,627.88	690.03	7,267.55	11,585.46
Minnesota	2,893.50	2,893.50	260.93	2,047.00	5,201.43
Ohio	2,452.85	2,452.85	356.41	2,369.57	5,218.67
Wisconsin	5,859.94	5,859.94	97.04	8,108.14	14,053.12
Sub-total	19,693.84	19,693.84	1,454.41	21,813.79	23,178.04
					2,276.20
Illinois	1,410.08	1,410.08			1,410.08
Indiana	-	-			-
Iowa	-	-			-
Michigan	754.71	754.71	692.75		1,427.46
Minnesota	-	-			-
Ohio	-	-			-
Wisconsin	-	-	699.85	38.63	732.46
Sub-total	2,111.79	2,111.79	1,433.60	38.63	1,478.23
Grand Total	22,039.63	22,039.63	2,874.01	21,882.42	49,795.06

BLISTER RUST CONTROL ON NATIONAL FORESTS,
NORTH CENTRAL REGION, 1943, PROJECT BLR-4

Objective

The objective of the Blister Rust Control Program on National Forests is to protect against blister rust all valuable white pine stands under Forest Service ownership. This involves initial and subsequent ribes eradication within infecting distances of white pine stands in order to bring such stands through to commercial maturity free from blister rust damage.

Memorandum of Understanding

Control work on National Forest lands is performed through a written Memorandum of Understanding between the Forest Service and the Bureau of Entomology and Plant Quarantine. The Forest Service is responsible for selection of pine areas to be protected, employment of labor and supervision, and operations of camps. The Bureau is responsible for the preparing of work plans and maps, keeping records, making reports, training of labor and supervision, and checking the adequacy of the control work.

Protective Zone Widths

Blister rust control involves the removal of ribes bushes within a pine stand and for a sufficient distance around it to assure protection. Formerly, this protection zone width was 900 feet. Within recent years this width has been reduced materially depending on forest types concerned. In live swamps of alder, cedar, etc. the zone width has been reduced to approximately 50 feet, or one crew width. Studies have failed to show serious damage to pines from swamp ribes, except for short distances. Ribes eradication in swamps is expensive. Due to perpetual moist conditions, and ability of ribes to regenerate by layering, it is almost impossible to permanently eradicate ribes in swamps. For these reasons, it is wiser to accept a small loss, if any, among pines bordering the swamps in preference to the relatively high cost of swamp ribes removal. The eradication of ribes in swamp borders removes those most dangerous to the pines.

The zone width in dense woodland has been reduced to approximately 300 feet and in open woodland to 600 feet. The screening effect of forest growth is such a deterrent to the movement of pine infecting spores produced on ribes that under most conditions little pine infection results from ribes beyond such protection zones. In the open the full 900 foot zone is maintained.

Rust Conditions

General Status for 1943

Abundant rainfall and prolonged periods of high humidity, as in previous years, prevailed in 1943. As a result, a greatly increased intensification of the rust was noted. Blister rust on either pines or ribes is present in greater or lesser degree on all of the forests in Michigan, Wisconsin and Minnesota. It is less abundant on the Huron and Manistee Forests in Lower Michigan. In the other six forests, it is well established throughout the white pine belt and is intensifying rapidly in unprotected stands. The same conditions favorable to rust development were equally favorable to germination and growth of natural white pine seedlings. Unfortunately, however, in unprotected stands the present and potential loss of young white pines is far greater than the rate of establishment of new pines. This is particularly true on the Superior National Forest.

Significance of Present Rust Conditions

In order to better understand the significance of a small amount of pine infection in an unprotected stand, it is well to discuss briefly the development of pine infection. Three periods of development are recognized as follows:

- (1) Introductory Period
- (2) Period of Intensification
- (3) Period of Climax

(1) Introductory Period: This includes the period from initial pine infection to the time when approximately five percent of the pines are infected. It is characterized by relatively slow intensification of pine infection, ever increasing number of pines becoming infected at three or four year intervals. Negligible damage except on very small pines is apparent. Depending on ribes conditions and other factors, this period usually lasts from 4 to 10 years.

(2) Period of Intensification: This is the period of greatest increase in the number of pines becoming infected and in the formation of cankers. The percent of pines infected increases from about five percent to the approximate maximum of 90 to 95 percent. Waves of infection usually occur every year, particularly in advanced stages. Death of pines increases most rapidly in the younger age classes and more slowly among the larger trees. This period varies from 5 to 15 years depending upon volume of ribes, site, exposure, geographical and weather condition.

(3) Period of Climax: This period may be described as one of saturation. The rust has reached its greatest concentration under existing conditions. The number of new cankers formed each year is smaller due to decreasing amounts of living pine foliage and defoliation of ribes leaves by the rust before sporidial production. Elimination by death of all white pine trees is complete to the degree that the forest is no longer a white pine stand. Not only are existing white pines killed by blister rust, but also white pine

reproduction as it appears. The length of this period is indefinite. It continues so long as living pine foliage is present and the causative ribes factor remains.

Studies of pine infections in this Region, particularly in the north, by Dr. Honey and others have shown that on areas where ribes and white pines are closely associated the rust builds up so rapidly that in 5 to 15 years, after the rust hits, there is nearly complete pine infection and shortly thereafter elimination of white pine as a tree of importance in the stand.

Surveys made by Dr. Honey in four ranger districts of the Superior National Forest in 1942 show the rust to be widely distributed and for the most part to be in the introductory stages. Areas of course exist where the rust has already reached the damage stage, and these areas are getting larger and more numerous every year. Dr. Honey's surveys indicate that at the present rate of increase we can expect heavy intensification of the rust and the damage stage in which 90 percent of the pines will be infected and killed within 5 to 15 years.

General Status of Control

As Text Table 8 there is shown the status of control by National Forests in Region 9 as of December 31, 1943. The total control area containing 195,844 acres of white pine is 418,532 acres. Of this total, 265,954 acres, or 64.5 percent, have been initially worked, and 90,381 acres, or 23.5 percent are on maintenance. Most of the initial work remaining involves natural white pine, since all but 3,914 acres of the 55,605 acres of planted white pine have been initially worked. The great bulk of initial work yet to be done is on the Superior. It will also be noted that only an insignificant acreage of white pine on the Superior is on maintenance. Most of the white pine plantations not yet initially worked are on the Chippewa National Forest.

Local control work performed in 1943 is shown in Text Table 6. Initial work was done on the Huron, Manistee, Hiawatha, Superior and Chippewa National Forests. Re-eradication, chiefly second working, was performed on the Manistee, Ottawa, Hiawatha, Nicolet, Superior and Chippewa National Forests. Slightly more than half of the 24,116 acres worked were covered initially.

Labor was largely paid from Forest Service Regular funds, 3104. A small amount of work was done on Bureau Regular funds 3101, on the Huron and Manistee Forests, and men from C.P.S. camps performed ribes eradication on the Manistee.

Not included in Text Table 6 was nursery sanitation work around the Chittenden Nursery using regular Forest Service nursery employees under the immediate supervision of the Blister Rust District Leader of Lower Michigan. This nursery was given the eighth annual check for ribes. At a cost of 15 man-days, or \$55.00, 630 wild ribes were removed from 570 acres of sanitation zone to give continued protection to 5,500,000 white pine trees growing in the 60 acre nursery.

In Text Table 7 are shown the results of systematic checking after the 1943 ribes eradication. For the entire work an average of 1.7 bushes with 4.27 feet of live stem per acre was found. This is evidence of very good work, since the allowable maximum after eradication is 25 F.L.S. per acre. Approximately 96 percent of the 16,679 acres worked and checked showed less than 25 F.L.S. per acre after working.

Status of Control by Forests

Manistee National Forest - Michigan

Of all the national forests in the Region, the Manistee is the most suitable for white pine planting. It now contains 19,732 acres of planted white pine quite generally distributed over the forest. This is 35 percent of the total white pine planted on national forests in the Region, and is more than the combined total white pine planting on any three of them. All of the white pine, natural and planted on the Manistee has now been initially worked, and practically 80 percent of it is on a maintenance basis. Very fortunately, in the extensive oak forests under which white pine grows so well on the Manistee, ribes are generally scarce except in certain moist spots.

In 1943 732 acres of white pine, mostly planted, were initially protected by removing 5,631 ribes from 3,010 acres of control area at a cost of 30 man-days of C.P.S. labor supervised by the District Leader of blister rust control. On re-eradication, 20 C.P.S. man-days of labor were used in protecting 664 acres of white pine by destroying 1,554 ribes bushes on 1,406 acres of control area. According to the official check, ribes remained after eradication at the rate per acre of 0.49 bushes and 2.80 F.L.S.

The situation with respect to spread of blister rust on the Forest remained practically unchanged in 1943. Rust on ribes has been reported as quite generally distributed. Previously, pine infection had been found at two points near the Baldwin Ranger Station and at three points near Croton in the southeast corner of the forest.

Only a small amount of work is recommended for 1944. No initial work is needed except around any white pine plantations which may be established in 1944. Through an excellent working arrangement between the Forest Supervisor and the Blister Rust Control District Leader, the latter examines prospective white pine planting sites prior to planting in order to encourage the planting of white pine on sites where ribes are not abundant. Other work recommended includes re-eradication on 5,003 acres in four ranger districts at a total estimated cost of 138 man-days.

Huron National Forest - Michigan

The Beetle Homestead area containing 210 acres of natural pine within a control area of 400 acres was examined by the District Leader, found free of ribes and placed on maintenance.

The present control problem consists of 362 acres of natural pine, 1,062 acres of planted pine, within a total control area of 5,452 acres. All this has been initially worked, and more than half of it is on maintenance.

Rust conditions remained the same in 1943. Rust on ribes was generally distributed but known pine infections are limited to a few trees each near Mio, Lincoln and East Tawas.

Very little control work is recommended for 1944. Some post-check work, and the completion of re-eradication around Plantation No. P44C Sec. 36, T. 25N, R. 42 are needed. A few large Ribes cynosbati bushes were observed to be heavily infected with rust in 1943.

Marquette National Forest - Michigan

No work was done on this forest in 1943, and the status remains as in 1942. About equal acreage of planted and natural white pine make up the 10,691 acres listed for protection. There remain approximately 1,000 acres of each to be initially protected. About one-third of the pine acreage, chiefly in the northern third of the forest, is on a maintenance basis.

Rust on ribes is generally prevalent on the forest. Pine infection has been found at three localities: south of Moran, northwest of Rudyard, and southwest of Baco.

Work remaining to be done involves the initial protection of 2,019 acres of white pine requiring the removal of ribes from 4,250 acres of control area. Also needed is the post-checking of white pine areas initially worked to determine whether additional workings are necessary, or whether they can be placed on maintenance.

Hinewatha National Forest - Michigan

A small amount of ribes eradication work was performed on this forest in 1943. To protect initially 60 acres of natural pine, 7,388 ribes were removed from 265 acres of control area at a cost of 127 man-days. Re-eradication was performed by pulling 8,815 ribes from 580 acres to protect 178 acres of white pine. This work cost 159 man-days of labor which was furnished by the Forest Service.

The status of control in 1943 is not greatly changed from that in 1942. White pine is quite generally distributed over the forest. The problem involves the protection of 6,932 acres of pine over one-third of which is planted. All of the planted pine and all but 730 acres of natural pine have been initially protected. Of the 6,932 acres of white pine, 1,776 acres, or nearly 26 percent, are on maintenance.

Both ribes and pine infection are quite generally distributed over the Forest. One additional pine infection was found on the Squaw Creek area in 1943. Some intensification of the rust on pines was noted on areas where pine infection had been found previously.

Work recommended for 1944 includes ribes re-eradication on 3,155 acres in two areas worked initially in 1934 and 1938. Also initial work is needed to protect 203 acres of natural pine on four areas involving removal of ribes from 910 acres of control area. This recommended work will require an estimated 530 man-days of labor.

Ottawa National Forest - Michigan

This forest contains the largest amount of white pine, 11,743 acres, chiefly in the eastern half, of the three national forests in Upper Michigan. This acreage is made up of 7,899 acres of natural, and 3,844 acres of planted white pine. Resurvey and post-check work in 1943 showed a considerable amount of damage from snow, snowshoe hares and other causes. As a result, the 13,309 acres of pine listed for protection in 1942, were reduced to 11,743 acres in 1943, a reduction of 1,566 acres of pine and 3,374 acres of control area. As of December 31, 1943 initial protection had been afforded 6,617 acres of natural, and 3,673 acres of planted white pine, leaving 1,282 acres and 171 acres respectively still in need of initial protection. Only a negligible amount, 776 acres of pine, are on maintenance.

In May and June 1943, a group comprised of from 18 to 24 high school boys with two teachers performed re-eradication work on 4 areas initially worked five or more years previously. No initial work was done in 1943. Owing to the abundance of ribes, and high rate of rust intensification, it was decided that the areas chosen were in most immediate need of work. To protect 458 acres of planted, and 93 acres of natural white pine, 130,392 ribes were removed from 1,300 acres of control area at a cost of 546 man-days. The work was under the supervision of Mr. F. F. Stant, Forest Service Blister Rust Control Inspector. The systematic check after eradication showed ribes remaining at the rate of 8.6 bushes and 11.9 P.L.S. per acre. All but 40 acres of the 1,300 checked showed satisfactory work. Considering the facts that inexperienced high school boys were used and that ribes were abundant (averaging over 100 per acre) good work was done.

Blister rust is abundant, wide spread, and intensifying rapidly on the Forest. It has reached the damage stage on several unprotected white pine areas. Rust can be found on both hosts practically wherever pines and ribes are in association. Factors responsible for this condition are the prevalence of ribes throughout, the abundance of white pine, particularly young trees, and favorable climatic conditions. This last factor equally encourages white pine reproduction. However, in unprotected stands, the rust is killing young white pine trees faster than they can be replaced by natural reproduction. The rust is not doing damage in protected stands.

Work planned for 1944 should be on a sufficient scale, so far as labor conditions permit, to maintain protection by re-eradication on areas of young white pine initially worked several years ago, and to perform initial work most urgently needed. On the basis of surveys made in 1943, work should start as early in May 1944 as possible. A crew of 18 men from Iron River is needed for work on six areas in the Iron River District and six men from west of Ontonagon to protect the plantation south of Green. This program, mostly re-eradication, calls for working 2,655 acres of control area to maintain protection of 1,410 acres of pine at an estimated cost of 780 man-days. Further survey work is also needed in 1944.

Miscolet National Forest - Wisconsin

The general control problem on the Miscolet in 1943 remains approximately the same as that shown in the 1942 report. Listed for protection within the control problem are 5,225 acres of natural and 6,655 acres of planted pine, making a total of 12,060 acres. The total control area involved is 30,220 acres. To December 31, 1943, 4,403 acres of natural and 6,655 acres of planted pine have been initially protected by removing ribes from 25,822 acres. Thus there remain to be initially protected 822 acres of natural and 180 acres of planted white pine. The amount of white pine on maintenance, 356 acres is negligible. Thus, the essential problem involves the furnishing of initial protection to those areas needing it and performing re-eradication on most of the total acreage in order to establish maintenance conditions on valuable white pine stands in the Forest.

Most of the white pine lies in the Eagle River and Argonne Districts in the north and in the Lakewood District in the south.

In 1943, re-eradication work was performed on three plantations, totaling 2,050 acres of pine. To protect this acreage 69,180 ribes were removed from 3,075 acres of control area at a cost of 696 man-days. No initial work was performed in 1943. An excellent crew of experienced men and a few teen-age boys were used in this work. The re-eradication work done was for the purpose of continuing protection conditions around some of the finest white pine plantations on the Forest, originally worked several years ago. Previous to eradication, examinations of these areas showed that ribes were coming back, and that some infection from those ribes was appearing. Results of checking for ribes after eradication showed that all of the areas had less than 15 feet of live stem per acre with an average of 1.8 ribes bushes with 6.3 F.L.S. per acre.

Blister rust is abundant and well established throughout the Forest wherever the two host plants are associated. An examination of two small plantations, namely the Phelps School Forest in Township 42N., R. 12E. and the Consolidated Plantation in Township 31N., R. 15E. showed 90 percent and 61 percent of the trees infected, respectively. The association of host plants and favorable weather conditions are factors responsible for the rapid intensification of blister rust which is taking place. It is already too late to save certain white pine areas on the Forest and unless adequate measures are taken in the next few years a serious loss of young white pine trees is inevitable.

Based on recent surveys, a work plan showing blister rust control work most immediately needed and recommended for the fiscal year 1945 has been approved by the Forest and submitted to Milwaukee. The work recommended lies in the Lakewood and Eagle River Ranger Districts. Four areas of initial work involving 1,131 acres of control area and four areas of re-eradication involving 1,945 acres of control area are recommended for working in the fiscal year 1945. To perform ribes eradication on these 2,896 acres, it is estimated that 1,136 man-days are needed. The total cost of this proposed work plan is \$4,213.00.

Of even higher priority than the above work plan, control work scheduled for 1942 and 1943 but not completed, calls for ribes eradication on 1,630 acres at an estimated cost of 950 man-days. If manpower is available, this work should be performed prior to June 30, 1944, and the same crew used to perform the work as recommended for the fiscal year 1945. Additional post-check work is also needed during the coming field season.

Chequamegon National Forest - Wisconsin

The Chequamegon contains the largest amount of natural white pine on National Forests in Wisconsin. Most of this pine is concentrated in the Drummond District where it occupies extensive contiguous areas. Most of the 16,503 acres of white pine listed for protection has been initially worked with only 817 acres still needing initial protection. Approximately 10 percent or 1,631 acres of white pine are on maintenance. No ribes eradication was performed on this Forest in 1942 or 1943.

While ribes infection is quite general over the Forest, known pine infection centers are chiefly limited to the vicinity of Drummond. In places the rust is intensifying quite rapidly on unprotected pines.

A work plan for necessary control work on the Forest was prepared for the fiscal year 1944. Due chiefly to the lack of available labor, no work was done, and this same plan is applicable to the fiscal year 1945. The plan calls for ribes re-eradication on 4,013 acres and initial work on 150 acres at a total estimated expenditure of 806 man-days, costing approximately \$4,530.00. The areas recommended for working include those most immediately in need of protection because of the regeneration of ribes and the increased intensification of rust.

Superior National Forest - Minnesota

The Superior National Forest contains by far the largest amount of white pine of any of the forests in this Region. Listed in the control area as worth protecting are 89,109 acres of white pine involving 150,313 acres of control area. This pine has practically all been mapped. It is conservatively estimated that in the inaccessible portions of the Forest there exists an additional 100,000 acres of good white pine not yet mapped. During recent wet years white pine has seeded in and has become established at a rapid rate. Unfortunately, the same favorable climatic conditions and a great abundance of ribes closely associated with pines have resulted in an alarming intensification of the rust and the killing off of young white pine trees by blister rust in unprotected stands at a much faster rate than their increase by natural reproduction.

The problem of furnishing protection to white pine stands on the Superior is an enormous one. To the end of 1943, 27,564 acres of pine had been initially protected. On the basis of mapped pine this represents approximately 31 percent initially protected. However, on the basis of total estimates of white pine worth protecting on the Forest or 189,109 acres, there has been approximately, only 12 percent initially worked.

Initial ribes eradication work was performed on 16 areas in the Gunflint, Isabella, Le Croix and Forts Ranger Districts. Initial ribes eradication to protect 3,115 acres of natural white pine was performed on 3,619 acres of control area and 384,677 ribes were destroyed at a cost of 2,379 man-days. Re-eradication was performed on 15 areas on the Aurora, Isabella, Halfway and Mesaba Ranger Districts. The continued protection of 2,016 acres of planted pine was accomplished by the destruction of 175,669 ribes on 3,827 acres of control area at a cost of ~~1582~~ man-days.

1,582

Labor to perform this work was paid from Forest Service 3104 funds. Work was primarily done by men working out of three BRD camps on the Forest. High school boys made up the bulk of the laborers. During the month of June there was practically a 50 percent turnover of labor in the three camps. This was due principally to poor working conditions in the woods caused by the unusual rainy weather in June. This rainy weather brought with it large numbers of mosquitoes and sand flies. The best laborers were older men, chiefly of Finnish extraction employed on the Aurora and Mesaba Ranger Districts. These men, for the most part, were local farmers who were able to handle a full-time job in addition to their farm work. Occasionally they stayed at home a few days to catch up on their farm work. They took a particular interest in protecting the white pine because many of them had planted the pines, and were familiar with seeing the damage caused by blister rust within their own neighborhood. They constitute an ideal source of labor not only for blister rust control but for other forestry activities in the vicinity. The biggest local control program of any year on the Superior was performed in 1943. In general, labor was more easily obtained than anticipated and the recruiting of this labor, consisting largely of high school boys and local farmers who could work in the vicinity of their homes, did not compete with lumber camps needing labor.

Systematic checking after ribes eradication on the Superior showed ribes remaining at an average rate of 1.52 bushes and 3.89 F.L.S. per acre. All but 410 acres of the 7,415 acres checked were satisfactorily worked. This is an excellent record considering the large numbers of ribes that were present on the Superior and the fact that high school labor was largely used in ribes eradication.

Rust conditions are bad on this Forest and are rapidly getting worse. Several areas exist where the damage stage has been reached and the existing pines are too far gone to protect. The number of these areas and the size of each area are increasing each year. According to previous studies on the rate of rust development we may expect a disastrously high percent loss of white pines in most of the unprotected stands by 1950.

The amount of work recommended for the fiscal year 1945 on the Superior is dependent to a large extent on the labor situation. The labor market in northeastern Minnesota is subject to very rapid change. Labor available in 1944 may be less than it was in 1943. However even if we are able to obtain high school boys for blister rust control without competing with the logging industry, there are other high priority jobs on the Forest in connection with the War effort which can also use high school boys. For example, the establishment of a timber production access road is necessary as a means of getting out timber needed for the war effort from inaccessible areas.

Careful work plans have been developed in cooperation with the Forest Supervisor for initial and re-eradication work on the Gunflint, La Croix, Aurora and Mesaba Ranger Districts. This program contemplates the working of 5,287 acres at an estimated cost of 3,639 man-days. The plan calls for a slight reduction in man-days employed over what was performed in 1943 chiefly because of the additional need for high school labor on the part of the Forest Service. The proposed program would cost approximately \$30,000 for 1945.

Chippewa National Forest - Minnesota

The Chippewa National Forest is also a good white pine growing Forest. The 24,268 acres of white pine listed in the control problem are made up of 18,051 acres of natural and 6,217 acres of planted white pine. It thus ranks second to the Superior in natural white pine and is exceeded only by the Nicolet and Manistee in planted white pine. White pine occurs naturally on the Chippewa in association with red pine under which it grows well and eventually makes up the larger portion of the succeeding stand. In such situations ribes conditions are not bad. Most of the white pine plantings have been established in the Remer, Walker and Bena Districts in the southern part of the Forest.

Of the 24,268 acres of white pine listed in the control areas, 17,063 acres have been initially worked and 10,381 acres have been placed on maintenance.

During 1943, Mr. F. F. Staat, Forest Service Blister Rust Control Inspector, with the help of one assistant furnished by the Forest Service made a careful and intensive survey of worked and unworked areas, chiefly of natural pine on the Forest. As a result of his work it was possible to place a relatively large acreage of white pine, amounting to 4,857 acres, on maintenance in 1943 alone, bringing the total on maintenance to 10,381 acres. Also as a result of Mr. Staat's surveys a well-founded plan for future control work was made possible.

Our knowledge of the known extent of blister rust on pines was also brought about by Mr. Staat's surveys. Pine infection in limited amounts was found in 1943 in nearly all pine areas examined in the northern half of the Forest in localities where it previously was not known to exist. The rust is particularly heavy in the southwestern portion of the Forest near Cass Lake and Walker. In the southern part of the Forest the soil is somewhat richer and ribes are more abundant. In places the rust has reached the damage stage. However, timely re-eradication will prevent any serious loss in these plantations.

A work plan based largely on Mr. Staat's surveys has been made up for the 1944 season in cooperation with Forest officials. This plan calls for the working of 2,688 acres of control area at an estimated cost of 1,090 man-days. Proposed work would be performed on the Marcell, Bena, Dora Lake and Blackduck Districts. This work would give protection, either through initial or re-eradication, to 825 acres of planted and 404 acres of natural white pine.

Wayne National Forest - Ohio

According to records there are 505 acres of planted white pine on this Forest in southern Ohio, of which 199 acres have been initially worked and 147 acres are on maintenance. Since this Forest is in southern Ohio, where ribes are not abundant, it is probable that the balance of 304 acres of white pine not yet examined are also growing on land which is essentially free from ribes. White pine grows in excellent fashion in this part of the state due to proper soil conditions and long growing season. It is anticipated that practically no blister rust control problem will be involved in white pine plantings on the Wayne National Forest.

Hoozier National Forest - Indiana

According to records there are 70 acres of white pine plantings on the Hoozier National Forest in southern Indiana. While this area has not been examined from the blister rust control standpoint, it is probable that no problem is involved since this portion of Indiana, like southern Ohio is essentially ribes-free. White pine makes excellent growth in this part of the state.

Expenditures

Expenditures by National Forests in Region 9 and sources of funds for blister rust control in 1943 are shown in Tent Table 9. A total of \$42,542.72 of Forest Service funds and \$1,128,158 of funds under the control of the Bureau making a total of \$1,367,130 was spent on National Forests in this region in 1943. This is an increase of over \$11,000.00 spent in 1942. As shown in the table the largest single item, \$30,594.75, was spent on local control on the Superior National Forest. This increase in expenditures is indicative of the fact that more and more attention is being given to the necessity of protecting white pines on National Forests against blister rust in this Region.

Recommendations for 1944

Specific recommendations are given in the discussion of work on each National Forest. Detailed work plans and budgets have also been prepared cooperatively between representatives of the Forest Service and the Bureau of Entomology and Plant Quarantine. In planning work for the immediate future several factors must be carefully considered.

- (1) Rust is thoroughly established and intensifying so rapidly that in many cases a delay in ribes eradication of one to a few years will mean the loss of young white pine stands from blister rust.
- (2) Manpower available is no source as to preclude the performance of necessary control work. In order not to compete with labor immediately engaged in the war effort such as logging in the forested areas, older men and high school boys can be used in blister rust control work.

- (3) In the selection of areas for working during war times, great care must be exercised to make sure that only those areas are worked in which the young pine values are the greatest and in most immediate danger of damage from blister rust.

In view of the large amount of work yet to be done in accomplishing control work, of the rapidity with which the rust is intensifying, it is inevitable that millions of young pines on thousands of acres will be killed by blister rust. This means a loss of many existing white pine stands. However, on thousands of acres of such areas white pine is the best crop. In the post-war period or when labor becomes available the removal of ribes from such areas should be performed to permit future or continued development of white pine forests.

Text Table 6. Local Control on Forest Service Lands by
National Forest and Agency, North Central
Region, 1943

National Forest	Agency	No. Areas	Acres White Pine Protected			Acres Control Area Worked	Ribes Bushes Pulled	Costs In 8-hour Man-day
			Natural	Planted	Total			
Initial Eradication								
Huron	Bur.-Reg.	1	210	-	210	100	-	1
Manistee	Bur.-Reg.	6	18	331	349	1,670	10	4
	F.S.-C.P.S.	6	-	403	403	1,340	5,621	26
Sub-total		13	18	734	752	3,010	5,631	30
Hiawatha	F.S.-Reg.	2	60	-	60	285	7,389	127
Superior	F.S.-Reg.	16	3,145	-	3,145	3,619	281,677	2,372
Chippewa	F.S.-Reg.	30	3,290	-	3,290	5,408	-	*
Total Initial		61	6,623	734	7,357	12,602	397,696	2,537
Re-eradication								
Manistee	F.S.-C.P.S.	3	50	614	664	1,406	7,952	30
Ottawa	F.S.-Reg.	4	93	458	551	1,300	170,392	626
Hiawatha	F.S.-Reg.	3	120	58	178	580	8,815	159
Nicolet	F.S.-Reg.	3	-	2,050	2,050	3,075	69,180	696
Superior	F.S.-Reg.	15	-	2,016	2,016	3,827	175,669	1,522
Chippewa	F.S.-Reg.	14	625	-	625	1,229	-	*
Total Re-eradication		42	2,088	5,196	7,284	11,417	385,910	3,003
Total Eradication								
Huron	Bur.	1	210	-	210	100	-	1
Manistee	Bur.	6	18	331	349	1,670	10	4
	F.S.	9	50	1,017	1,067	2,746	7,175	46
Sub-total		15	58	1,348	1,416	4,436	7,185	50
Hiawatha	F.S.	2	180	58	238	285	15,203	286
Ottawa	F.S.	4	93	458	551	1,300	170,392	626
Nicolet	F.S.	3	-	2,050	2,050	3,075	69,180	696
Superior	F.S.	15	3,145	2,016	5,161	7,446	260,965	3,968
Chippewa	F.S.	14	4,015	-	4,015	5,032	-	*
Grand Total		105	7,911	5,930	13,841	22,416	793,606	5,540

* Man-days incidental to post- and advance-checking work:
Stearns' time: 30 man-days on post-check; 36 man-days on advance-check.
Helper's time: 18 man-days on post-check; 4 man-days on advance-check.

Text Table 7. Results of Checking After Ribes Eradication on National Forest Lands,
North Central Region, 1943

National Forest	No. Area	Acres Worked	Checking After Eradication			Ribes per Acre			Classification of Worked Areas On Basis of Ribes F.L.S. Remaining After Eradication		
			Strip Acres	Ribes Found		Bushes	F.L.S.	F.L.S.	0.0 to 15.0 F.L.S. Acres	15.1 to 25.0 F.L.S. Acres	25.1 to 50.0 F.L.S. Acres
				Bushes	F.L.S.						
Huron	1	100	8.0	0	0.0	0.00	0.00	400	-	-	-
Manistee	15	4,416	87.5	43	252.0	0.49	2.80	4,226	-	-	190
Ottawa	3	1,300	19.3	166	231.0	8.60	11.90	1,100	160	-	40
Hiawatha	4	845	11.3	27	55.0	2.30	4.80	835	10	-	-
Nicolet	2*	2,300*	26.0	46	163.0	1.80	6.30	2,300	-	-	-
Superior	29**	7,418**	137.5	210	535.7	1.52	3.89	6,988	20	-	410
Chippewa	***	-	-	-	-	-	-	-	-	-	-
Total	54	15,679	289.6	492	1,235.7	1.70	4.27	15,849	190	-	640

* 1 Area with 775 acres additional not officially checked.

** 2 Areas with 28 acres additional not officially checked.

*** 44 Areas with 6,634 acres additional not officially checked but
placed on maintenance by T. V. State of U. S. Forest Service.

Text Table 8. Status of Control on Forest Service Lands Within National Forests,
North Central Region, 1943

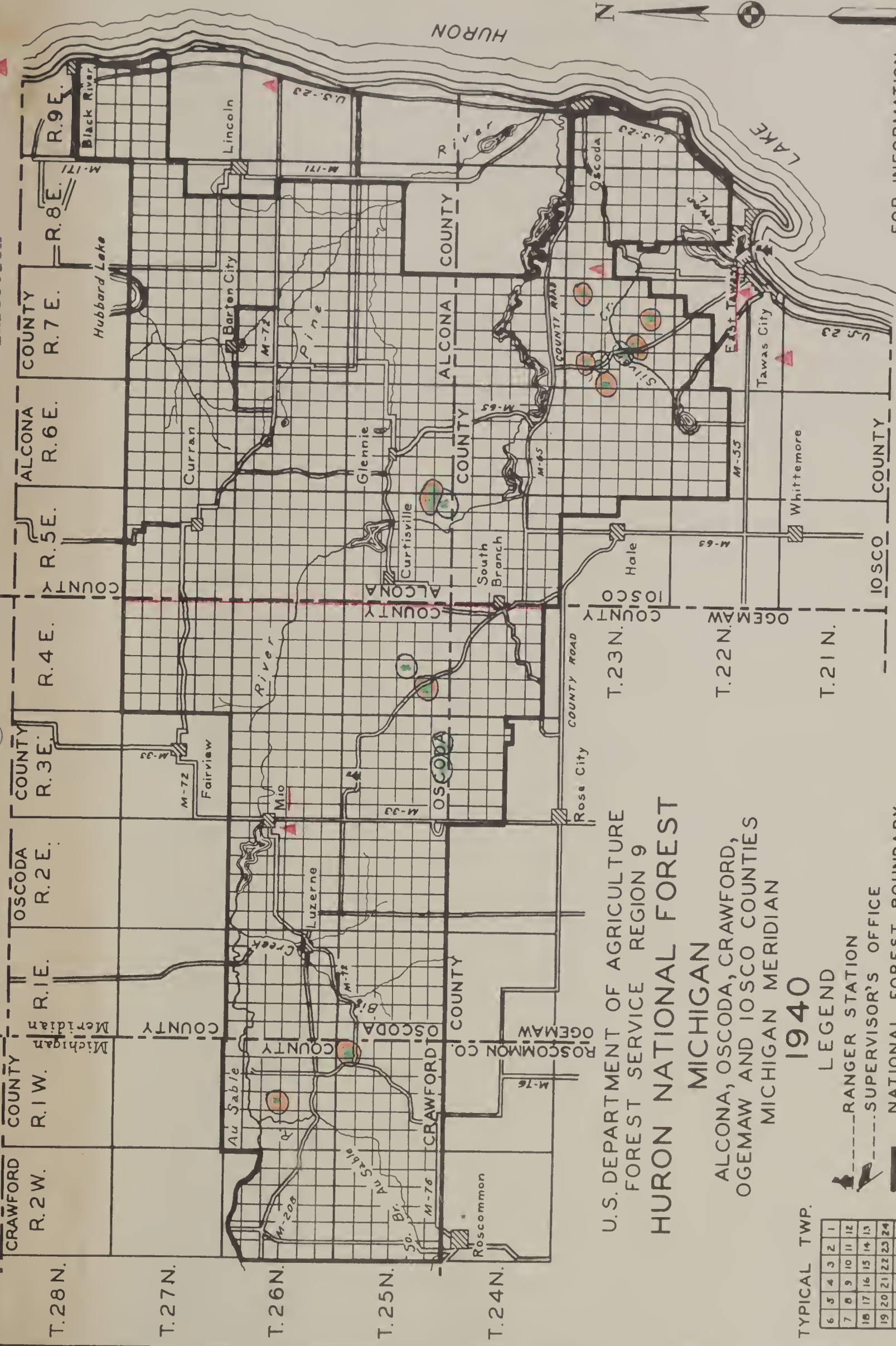
National Forest	Total Control Problem.				Net Acres Initially Worked				Net Acres Not Initially Worked				Net Acres on Maintenance	
	Net Acres		Total		Planted		Control		Planted		Control		Net Acres on Maintenance	
	Natural Pine	Planted Pine	Total Pine	Control Area	Natural Pine	Planted Pine	Total Pine	Control Area	Natural Pine	Planted Pine	Total Pine	Control Area	Net Acres on Maintenance	Net Acres on Maintenance
Ruron	362	1,062	1,424	5,452	362	1,062	1,424	5,452	-	-	-	-	746	3,092
Manistee	804	19,732	20,536	64,970	804	19,732	20,536	64,970	-	-	-	-	16,336	50,908
Marquette	5,551	5,140	10,691	25,299	4,349	4,323	8,672	21,049	2,019	4,250	6,269	3,030	3,606	6,606
Hiawatha	4,381	2,551	6,932	20,879	3,651	2,551	6,202	17,849	730	3,030	3,760	5,345	1,776	5,462
Ottawa	7,899	3,844	11,743	24,744	6,617	3,673	10,290	19,399	1,453	5,345	6,798	776	1,611	1,611
Nicolet	5,225	6,835	12,060	30,220	4,403	6,655	11,058	25,822	1,002	4,398	5,399	355	1,030	1,030
Chequamegon	11,776	4,732	16,508	41,265	11,311	4,380	15,691	37,644	817	3,621	4,438	1,681	3,804	3,804
Superior	84,190	4,919	89,109	150,318	22,673	4,891	27,564	40,219	61,545	110,099	171,644	1,842	1,963	1,963
Chippewa	18,051	6,217	24,268	51,248	12,838	4,225	17,063	35,722	7,205	15,526	22,731	10,581	29,541	29,541
Wayne	-	503	503	3,746	-	199	199	1,798	304	1,948	2,252	147	1,090	1,090
Hoozier	-	70	70	391	-	-	-	-	70	391	461	-	-	-
Total	155,830	89,500	245,330	446,359	155,830	89,500	245,330	446,359	75,445	248,885	324,330	37,445	8,541	8,541

Text Table 9. Costs of Ribes Eradication, National Forests, Region 9, 1943

National Forest	Forest Service Control		Bureau Control		Grand Total
	Regular 3104	C.P.S.	Regular 3101	Total	
Huron, Mich.	-	-	\$16.25	\$16.25	\$16.25
Manistee, Mich.	-	\$54.75	260.10	260.10	314.85
Ottawa, Mich.	\$3,106.58	-	-	-	3,106.58
Hiawatha, Mich.	1,594.24	-	80.00	80.00	1,674.24
Nicolet, Wis.	3,656.51	-	-	-	3,656.51
Superior, Minn.	30,594.75	-	-	-	30,594.75
Chippewa, Minn.	See below: Included in "Mapping & Surveys"	-	-	-	-
Sub-total	38,952.08	54.75	356.35	356.35	39,363.18
Manistee, Mich.	-	-	45.20	45.20	45.20
Ottawa, Mich.	583.65	-	-	-	583.65
Hiawatha, Mich.	-	-	-	-	-
Nicolet, Wis.	-	-	-	-	-
Superior, Minn.	-	-	727.03	727.03	727.03
Chippewa, Minn.	953.76	-	-	-	953.76
Milwaukee (State)	1,998.48	-	-	-	1,998.48
Sub-total	3,535.89	-	772.23	772.23	4,308.12
Grand Total (region)	42,487.97	54.75	1,128.58	1,128.58	43,671.30

0 Acres White Pine not Protected
 1424 Acres White Pine First Working

746 Acres White Pine On Maintenance
 White Pine Infection



U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE REGION 9
 HURON NATIONAL FOREST
 MICHIGAN
 ALCONA, OSCODA, CRAWFORD,
 OGE MAW AND IOSCO COUNTIES
 MICHIGAN MERIDIAN

1940

LEGEND

- RANGER STATION
- SUPERVISOR'S OFFICE
- NATIONAL FOREST BOUNDARY
- MAIN HIGHWAYS

NOTE: ROAD LOCATIONS COMPILED FROM BEST AVAILABLE INFORMATION AND ARE ONLY APPROXIMATE.

SCALE: ONE SMALL SQUARE EQUALS ONE SQUARE MILE.

FOR INFORMATION
 CONTACT
 FOREST SUPERVISOR
 U.S. FOREST SERVICE
 EAST TAWAS, MICHIGAN



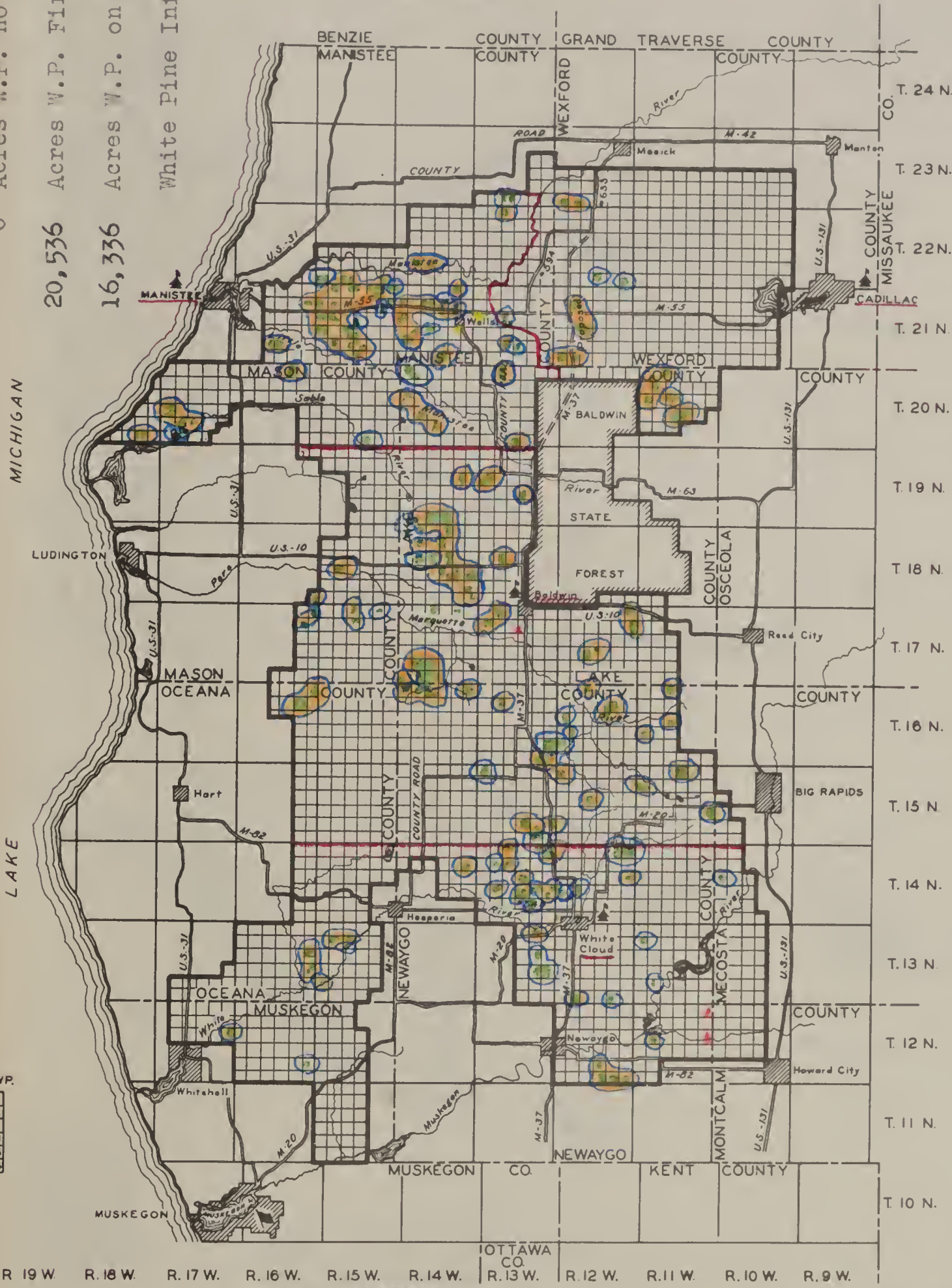
- Acres W.F. not Protected
- 20,536 Acres W.P. First Working
- 16,336 Acres W.P. on Maintenance
- ▲ White Pine Infection

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9
MANISTEE NATIONAL FOREST
MICHIGAN

MANISTEE, WEXFORD, MASON, LAKE, OCEANA, NEWAYGO,
MECOSTA, MUSKEGON, AND MONTCALM COUNTIES
MICHIGAN MERIDIAN

TYPICAL TWP.

6	5	4	3	2	1
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36



- LEGEND**
- ▲ RANGER STATION
 - SUPERVISOR'S OFFICE
 - NATIONAL FOREST BOUNDARY
 - MAIN HIGHWAYS





SCALE: ONE SMALL SQUARE
EQUALS ONE SQUARE MILE.

NOTE: ROAD LOCATIONS COMPILED FROM BEST
AVAILABLE INFORMATION AND ARE ONLY APPROXIMATE.

FOR INFORMATION
CONTACT
FOREST SUPERVISOR
U.S. FOREST SERVICE
MUSKEGON, MICHIGAN

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9
MARQUETTE NATIONAL FOREST
MICHIGAN
CHIPPEWA AND MACKINAC COUNTIES
MICHIGAN MERIDIAN

Legend

-  Unprotected White Pine
2,019 Acres
-  White Pine Protected
8,672 Acres
-  White Pine on Maintenance
R.I.E. 3,404 Acres
-  Pine Infected

T. 48 N.

T. 47 N.

T. 46 N.

T. 45 N.

T. 44 N.

T. 43 N.

T. 42 N.

T. 41 N.

T. 40 N.

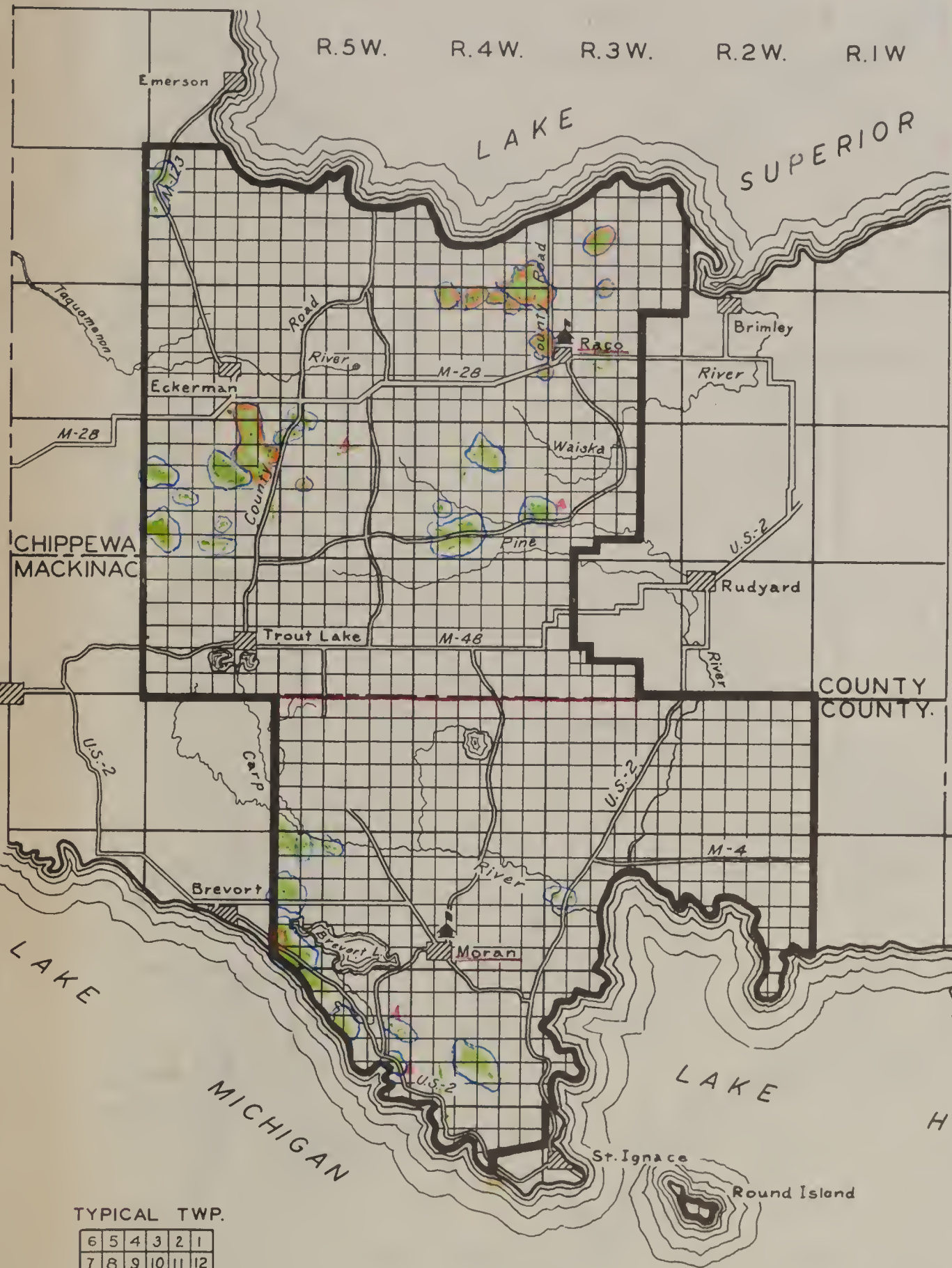
Govt. Island No. 6

HURON

T. 40 N.

R. 7 W. R. 6 W.

R. 5 W. R. 4 W. R. 3 W. R. 2 W. R. 1 W



CHIPPEWA
MACKINAC

COUNTY
COUNTY.

Rexton

LAKE
MICHIGAN

LAKE

HURON

St. Ignace




Round Island



TYPICAL TWP.

6	5	4	3	2	1
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36

LEGEND

-  RANGER STATION
-  NATIONAL FOREST BOUNDARY
-  MAIN HIGHWAYS

NOTE: ROAD LOCATIONS COMPILED FROM BEST AVAILABLE INFORMATION AND ARE ONLY APPROXIMATE.

FOR INFORMATION
CONTACT
FOREST SUPERVISOR
U.S. FOREST SERVICE
ESCANABA, MICHIGAN

SCALE: ONE SMALL SQUARE
EQUALS ONE SQUARE MILE.

THE STATE OF TEXAS

COUNTY OF DALLAS

SECTION 36



Surveyed and returned to the County Clerk for record

on the 1st day of May 1881

Witness my hand and seal of office this 1st day of May 1881

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9
HIAWATHA NATIONAL FOREST
MICHIGAN

ALGER, SCHOOLCRAFT, DELTA
AND MARQUETTE COUNTIES

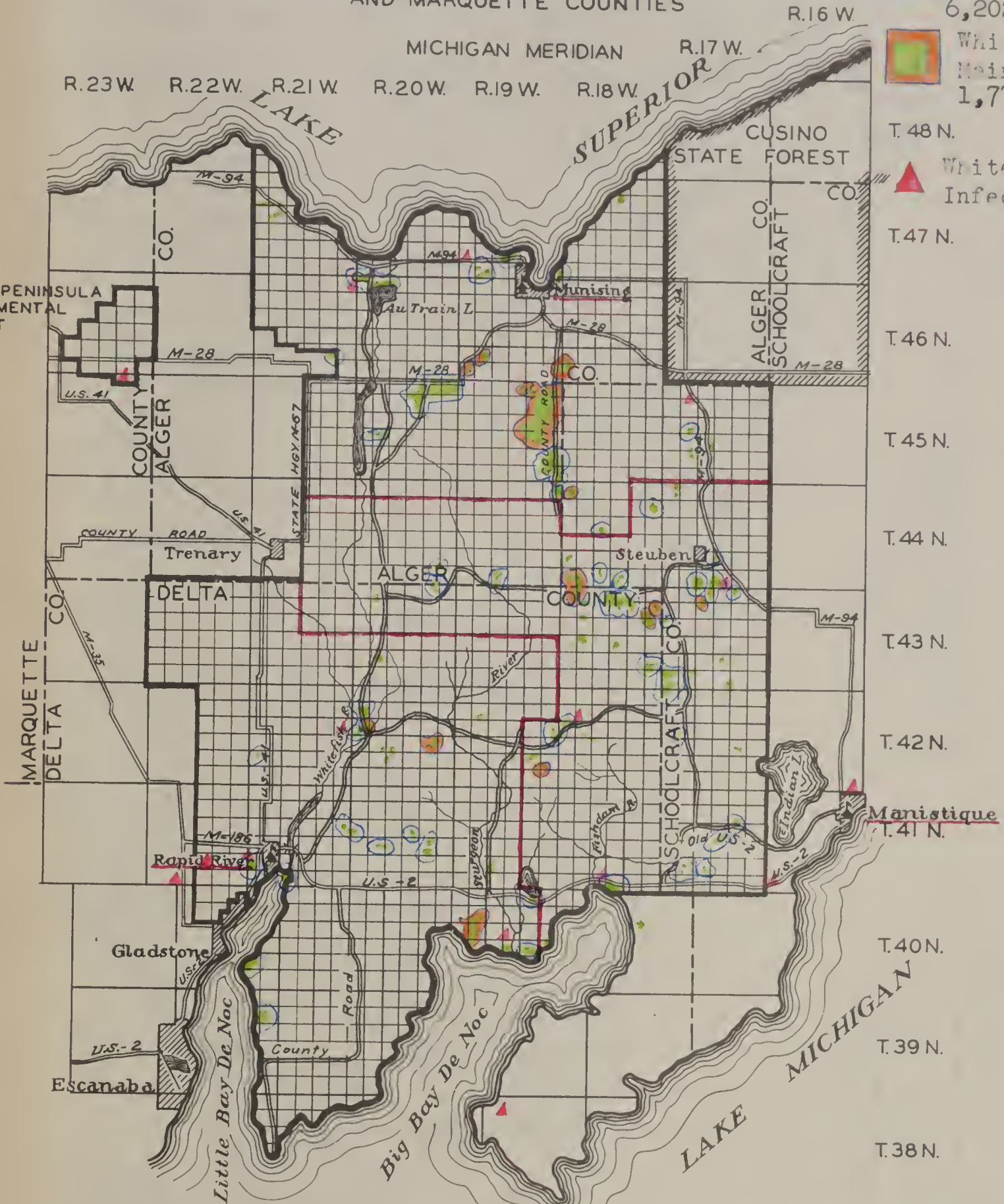
Legend
Unprotected
White Pine
730 Acres

White Pine
Protected
6,202 Acres

White Pine
Maintenance
1,776 Acres

White Pine
Infected

UPPER PENINSULA
EXPERIMENTAL
FOREST



TYPICAL TWP

6	5	4	3	2	1
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36

NOTE: ROAD LOCATIONS COMPILED
FROM BEST AVAILABLE INFORMATION
AND ARE ONLY APPROXIMATE.

LEGEND
----- RANGER STATION
----- SUPERVISOR'S OFFICE
----- NATIONAL FOREST BOUNDARY
----- MAIN HIGHWAYS
----- STATE FOREST BOUNDARY
SCALE: ONE SMALL SQUARE EQUALS ONE
SQUARE MILE.

FOR INFORMATION
CONTACT
FOREST SUPERVISOR
U.S. FOREST SERVICE
ESCANABA, MICHIGAN

Distribution of White Pine and Status of Control

Legend

White Pine Unprotected: 1,453 Acres

White Pine Protected: 10,290 Acres

White Pine Maintenance

White Pine Infected

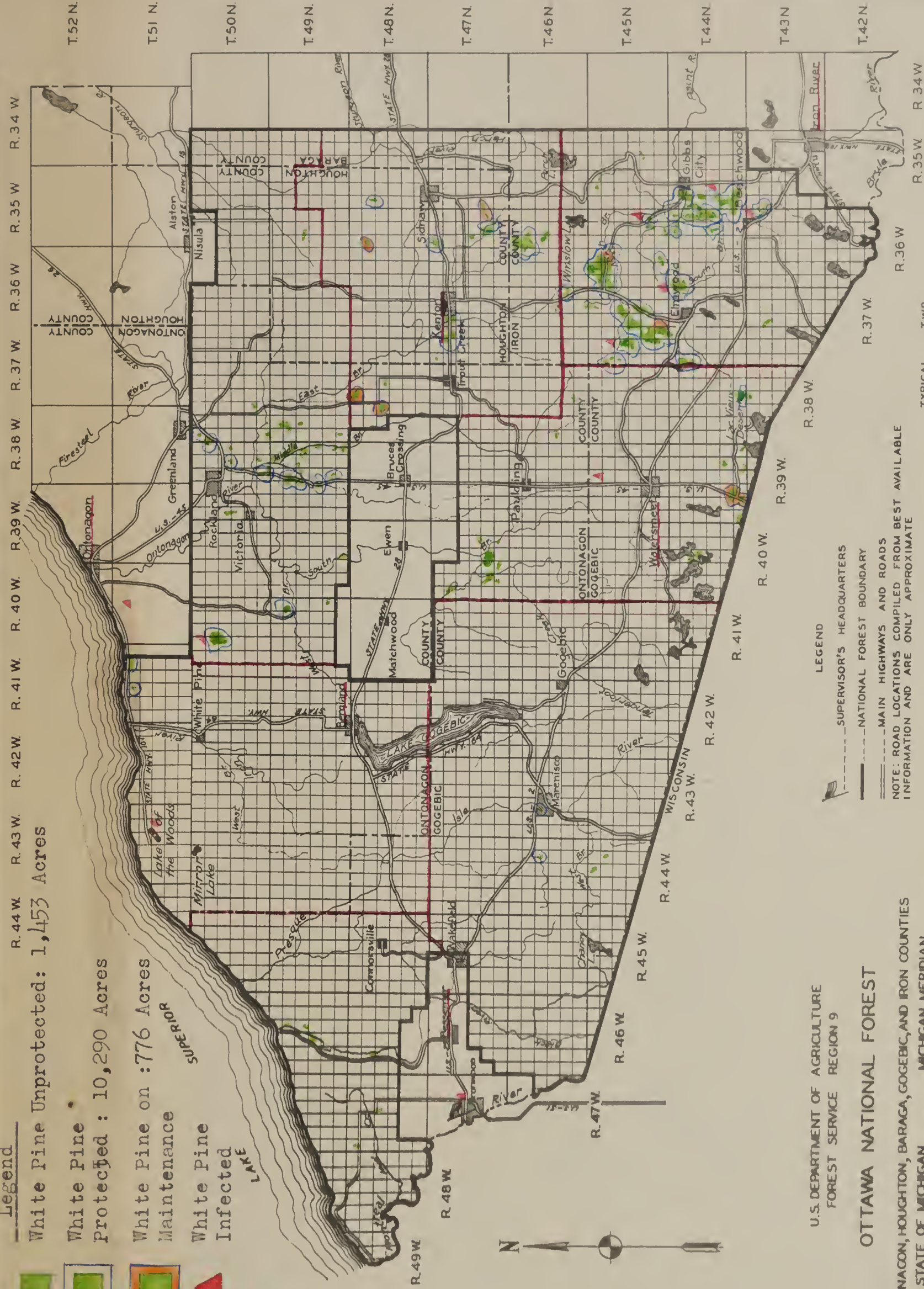
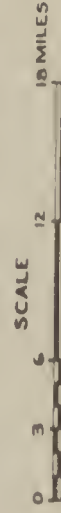


U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9

OTTAWA NATIONAL FOREST

ONTONAGON, HOUGHTON, BARAGA, GOGEBIC, AND IRON COUNTIES
STATE OF MICHIGAN

1937



- LEGEND**
- SUPERVISOR'S HEADQUARTERS
 - NATIONAL FOREST BOUNDARY
 - MAIN HIGHWAYS AND ROADS

NOTE: ROAD LOCATIONS COMPILED FROM BEST AVAILABLE INFORMATION AND ARE ONLY APPROXIMATE

FOR INFORMATION CONTACT:
FOREST SUPERVISOR
U.S. FOREST SERVICE
IRONWOOD, MICHIGAN

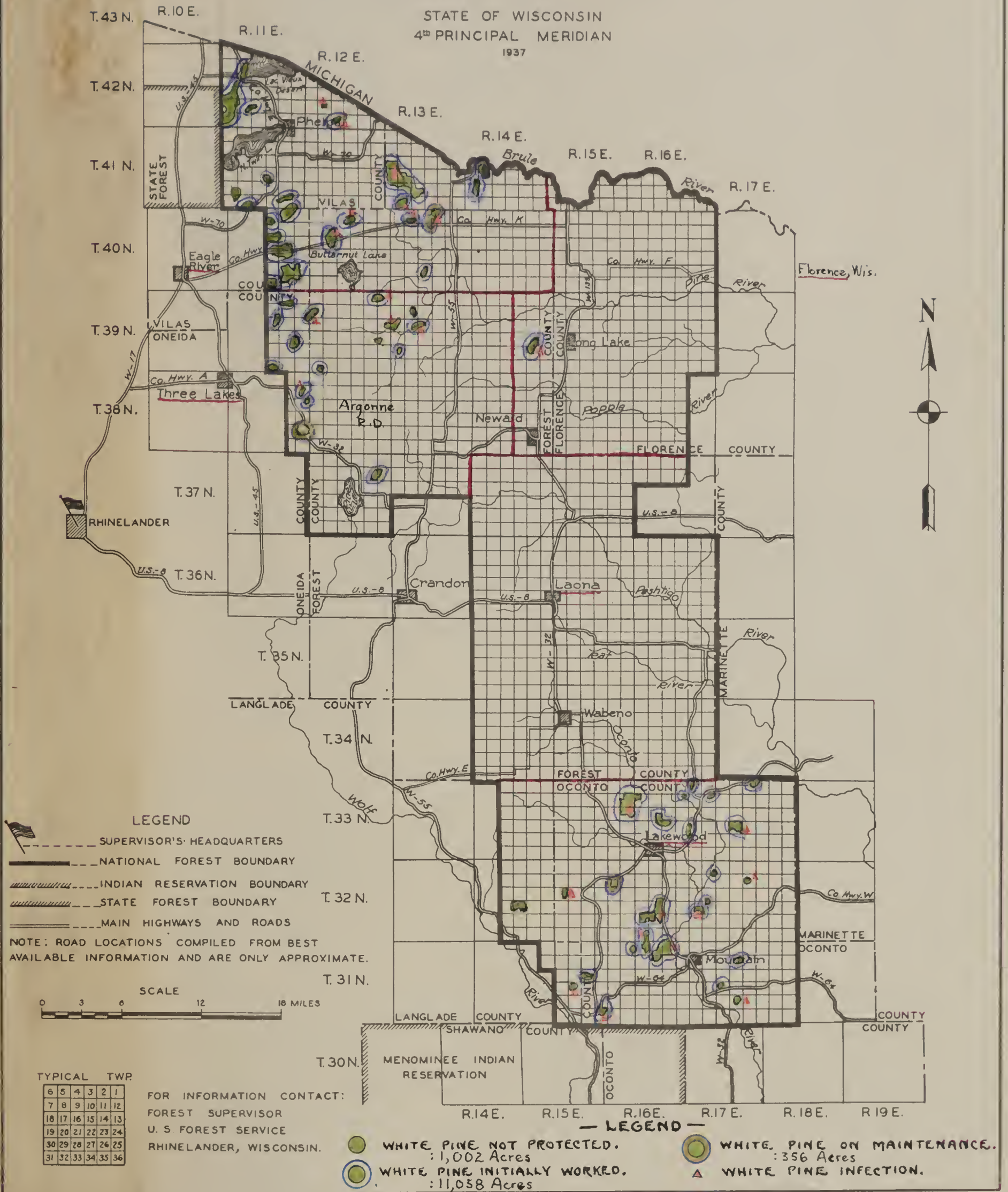
TYPICAL TWP

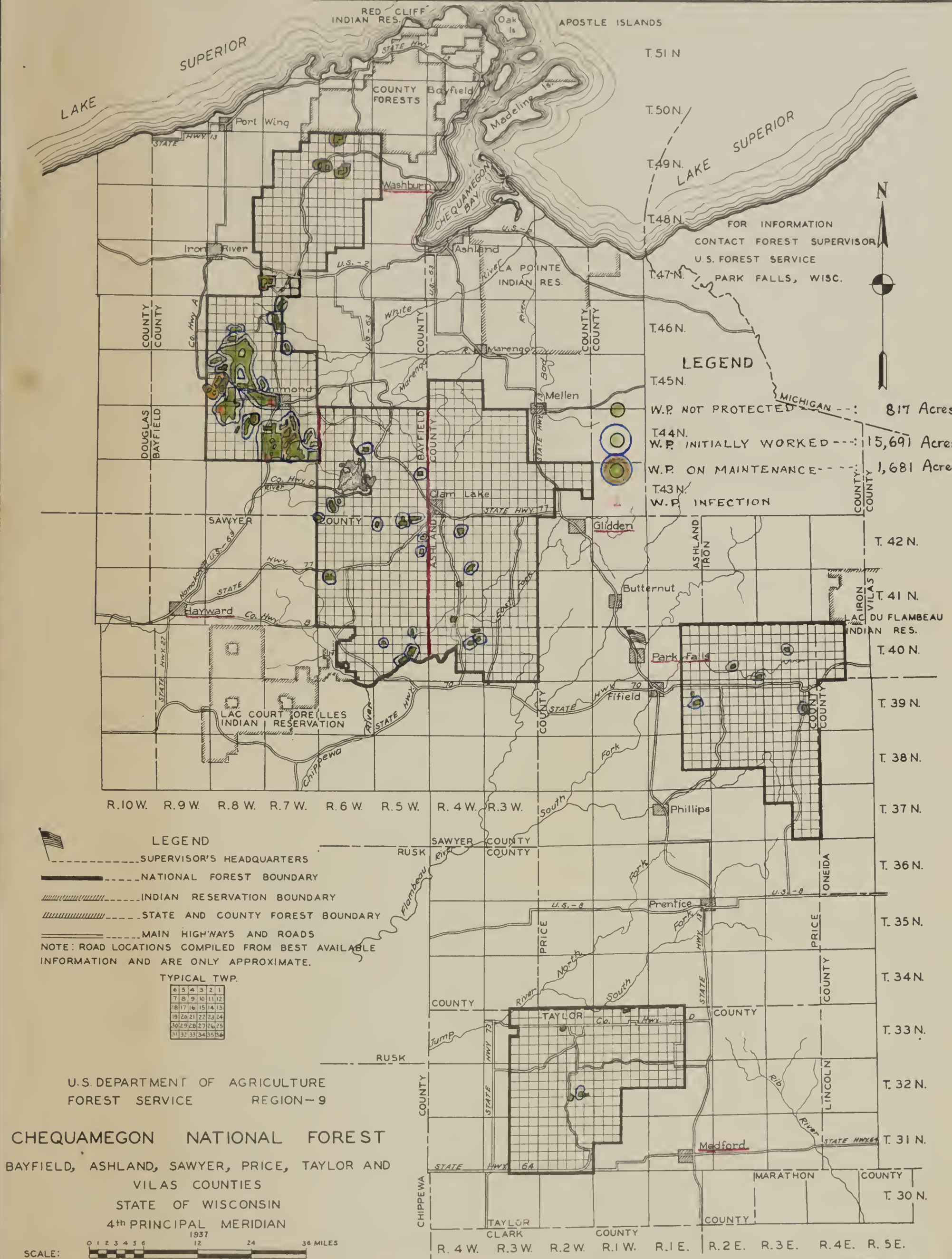
6	5	4	3	2	1
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9
NICOLET NATIONAL FOREST

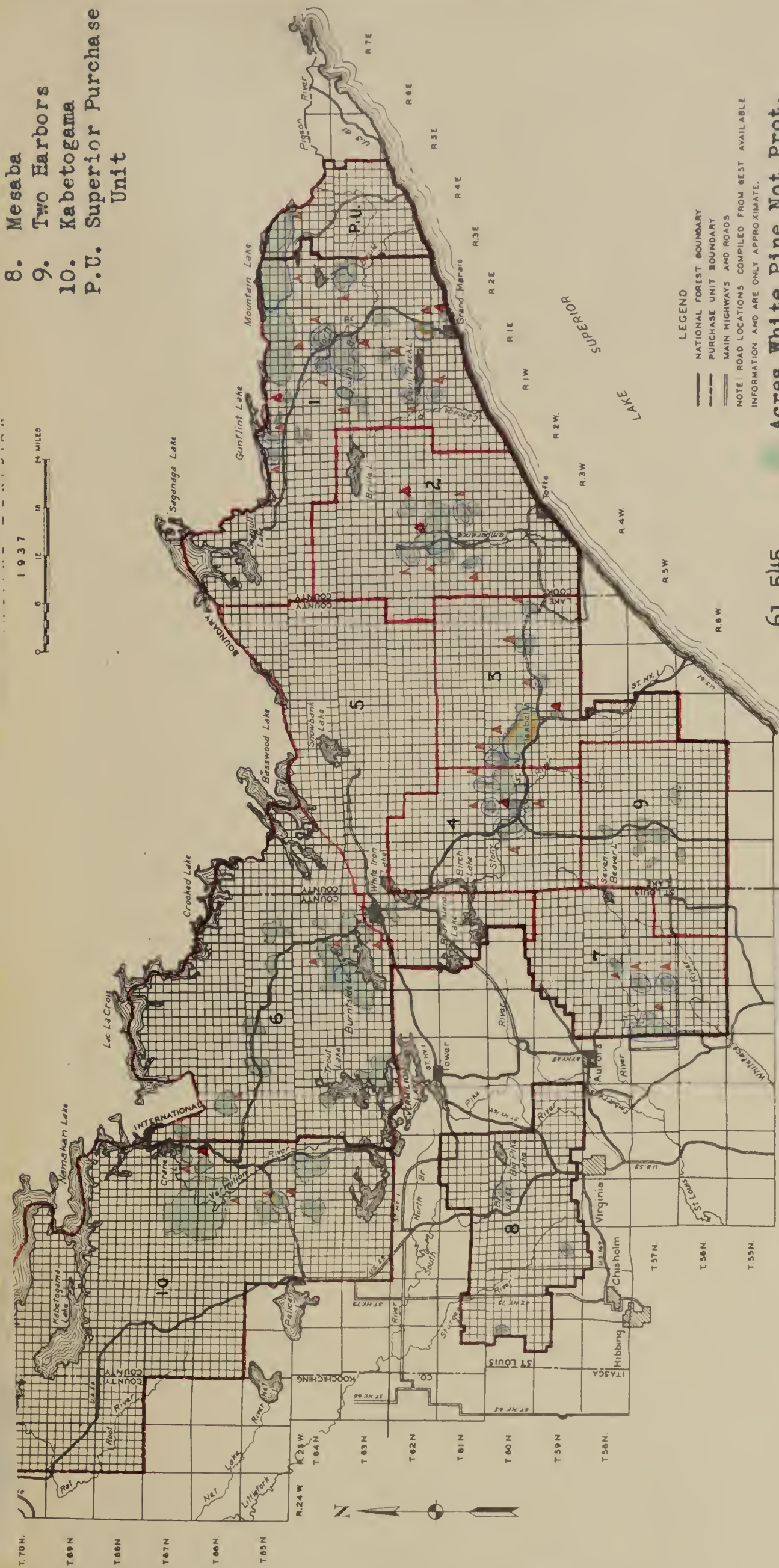
VILAS, ONEIDA, FLORENCE, FOREST,
LANGLADE, AND OCONTO COUNTIES

STATE OF WISCONSIN
4th PRINCIPAL MERIDIAN
1937





8. Mesaba
9. Two Harbors
10. Kabetogama
- P.U. Superior Purchase Unit



LEGEND

- NATIONAL FOREST BOUNDARY
- PURCHASE UNIT BOUNDARY
- MAIN HIGHWAYS AND ROADS

NOTE: ROAD LOCATIONS COMPILED FROM BEST AVAILABLE INFORMATION AND ARE ONLY APPROXIMATE.

61,545	Acres White Pine Not Prot.
27,564	Acres White Pine Init. Worked
1,842	Acres White Pine on Maintenance
	White Pine Infection

1,842 TWP

RANGER DISTRICTS

- 1- Bena
- 2- Blackduck
- 3- Cass Lake
- 4- Cut Foot Sioux
- 5- Dora Lake
- 6- Marcell
- 7- Remer
- 8- Walker

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9

CHIPPEWA NATIONAL FOREST

BELTRAMI, ITASCA, AND CASS COUNTIES

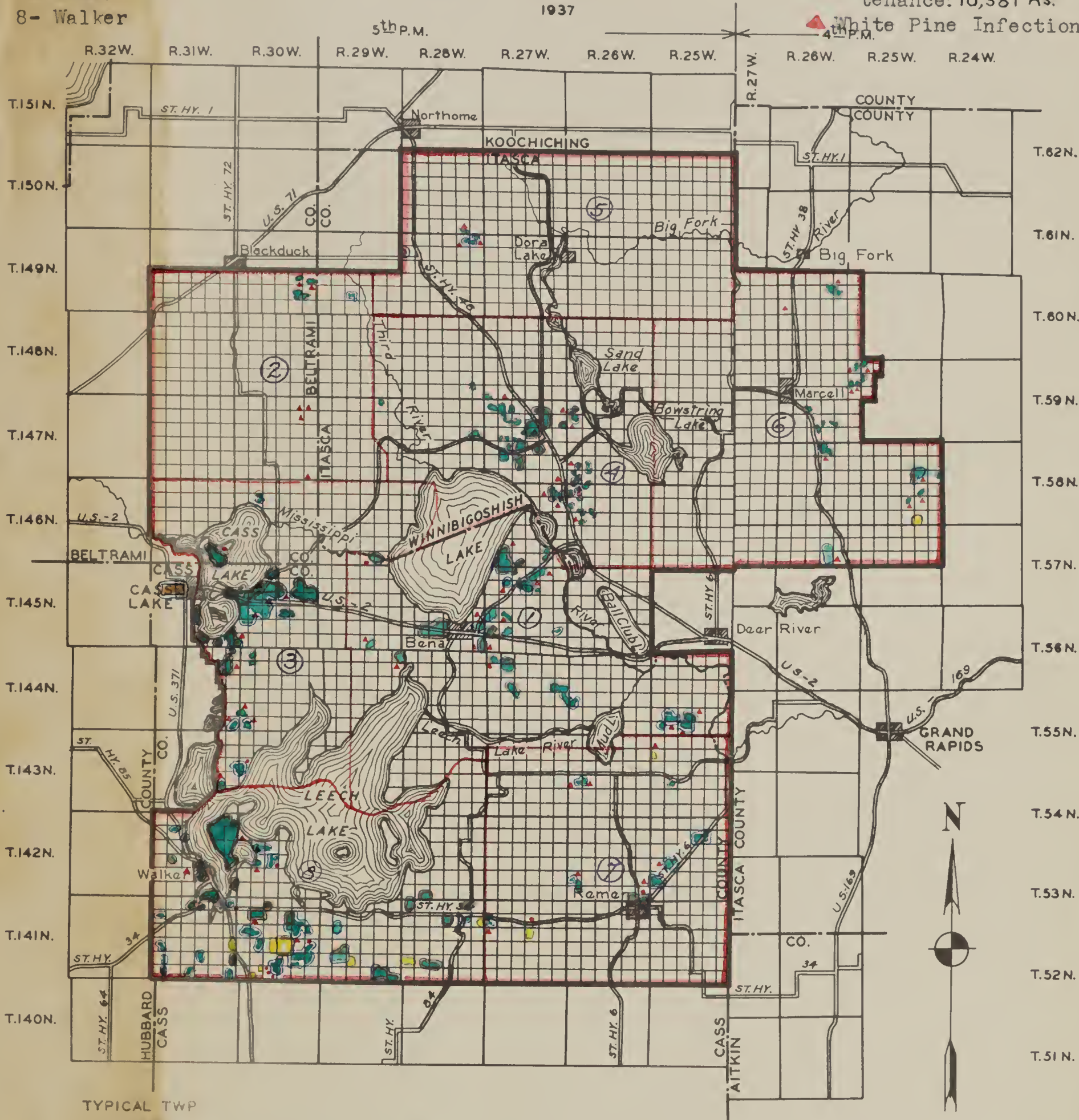
STATE OF MINNESOTA

4th & 5th PRINCIPAL MERIDIAN

1937

LEGEND

- White Pine Not Protected: 7,205 A's.
- White Pine Initially Worked: 17,063 A's.
- White Pine On Maintenance: 10,381 A's.
- ▲ White Pine Infection



TYPICAL TWP

6	5	4	3	2	1
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36

SCALE



LEGEND

- ▲ SUPERVISOR'S OFFICE
- NATIONAL FOREST BOUNDARY
- MAIN HIGHWAYS AND ROADS

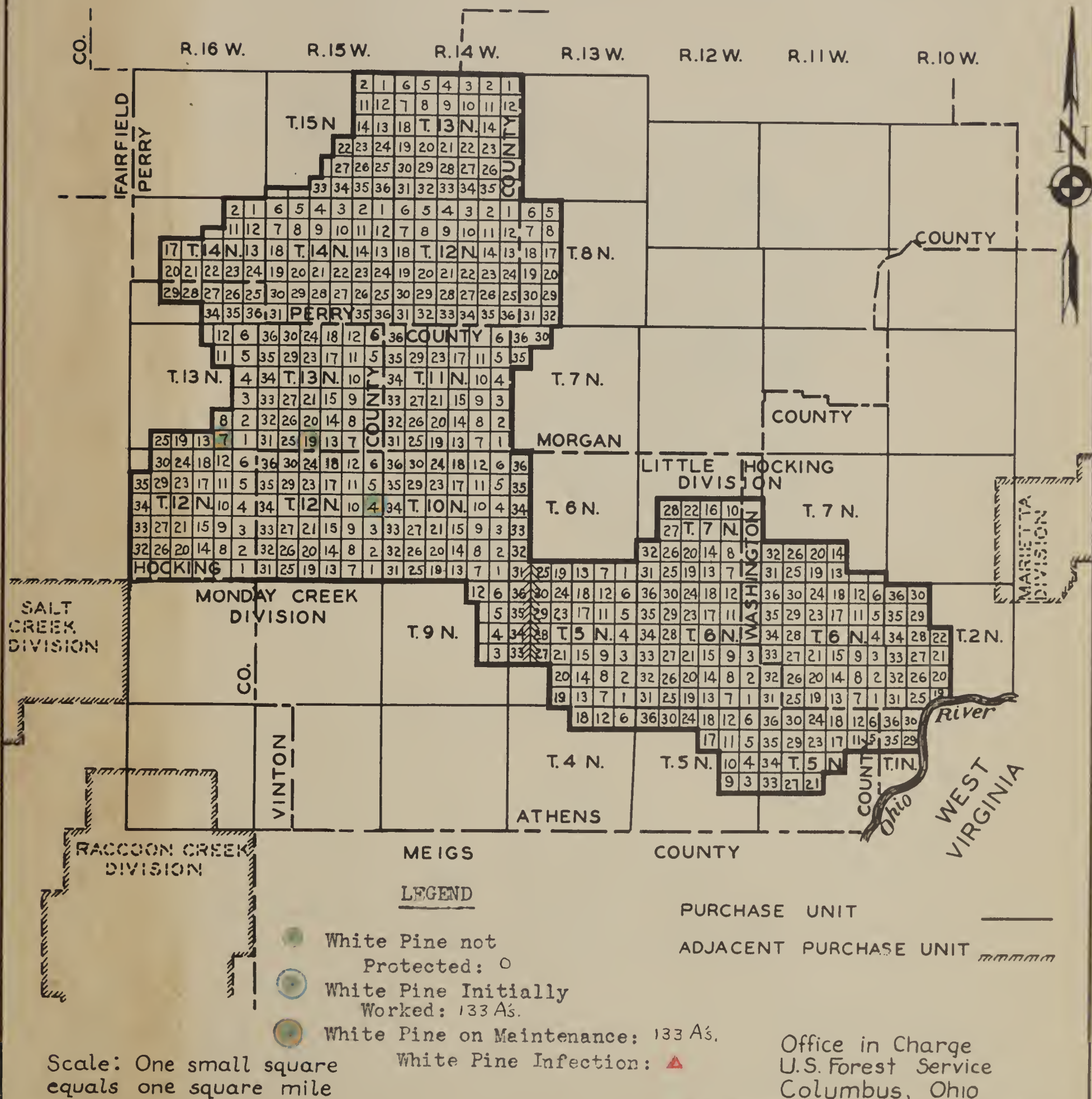
NOTE: ROAD LOCATIONS COMPILED FROM BEST AVAILABLE INFORMATION AND ARE ONLY APPROXIMATE.

FOR INFORMATION
CONTACT:
FOREST SUPERVISOR
U.S. FOREST SERVICE
CASS LAKE, MINNESOTA

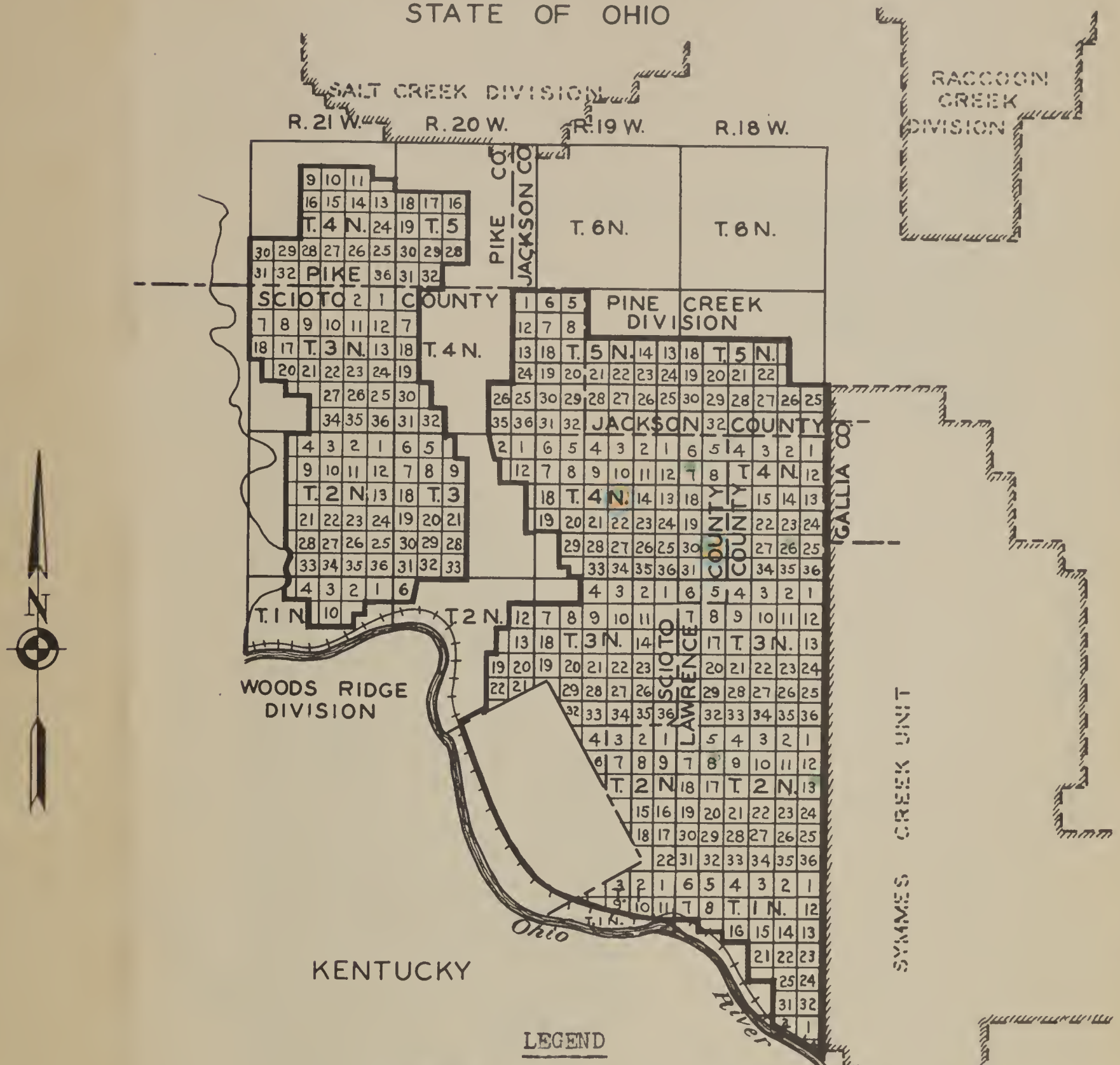
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9

HOCKING VALLEY PURCHASE UNIT
MONDAY CREEK AND LITTLE HOCKING DIVISIONS

WASHINGTON, ATHENS, HOCKING,
PERRY AND MORGAN COUNTIES
STATE OF OHIO



U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9
LITTLE SCIOTO PURCHASE UNIT
WOODS RIDGE AND PINE CREEK DIVISIONS
PIKE, JACKSON, LAWRENCE
AND SCIOTO COUNTIES
STATE OF OHIO



PURCHASE UNIT

ADJACENT PURCHASE UNIT

LEGEND

White Pine not

Protected: 75 A's.

White Pine Initially

Worked: 14 A's

White Pine on Maintenance: 14 A's.

White Pine ~~on~~ Infection:

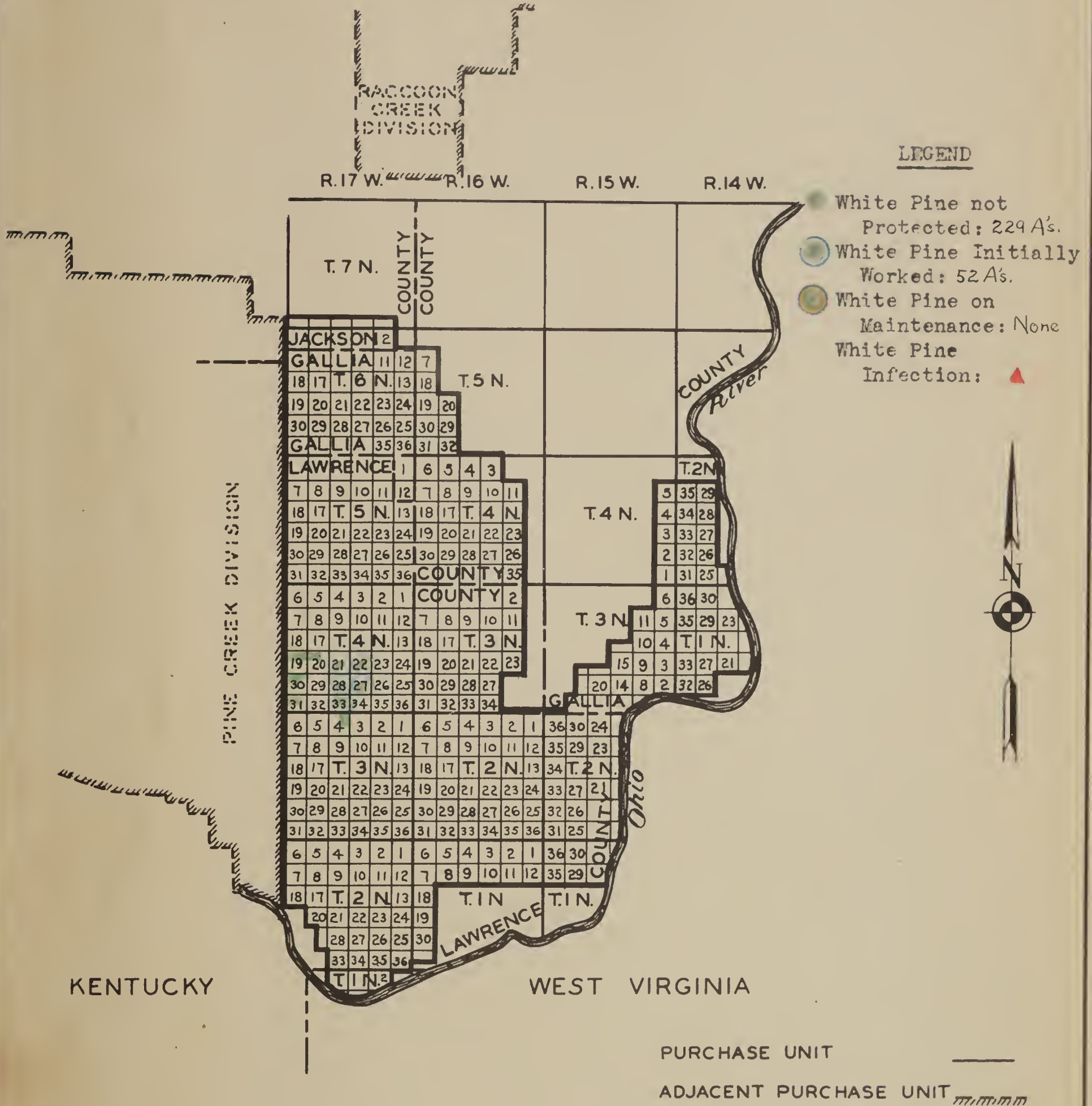
Scale: One small square
equals one square mile

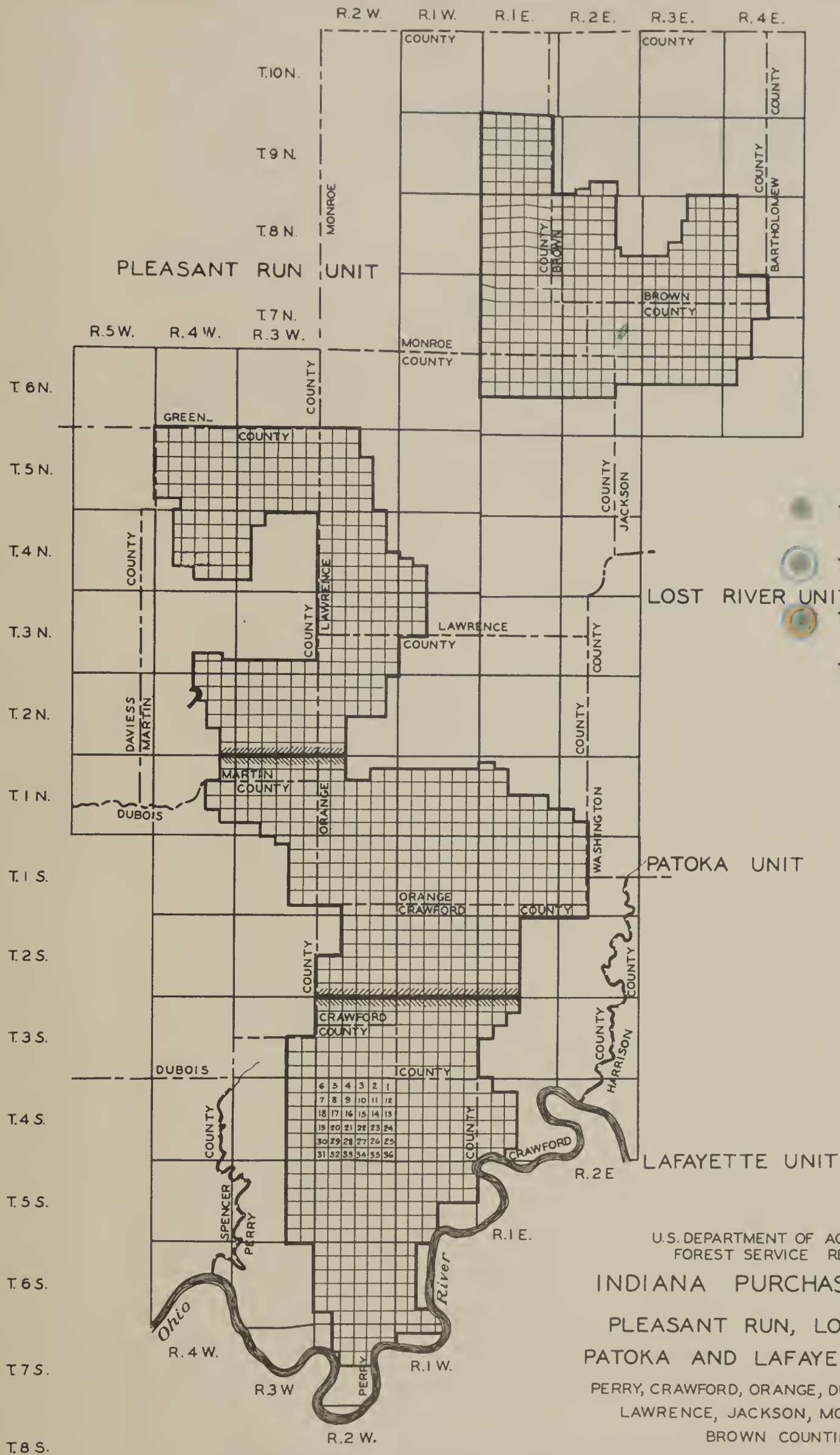
Office in Charge
U.S. Forest Service
Columbus, Ohio.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9

SYMMES CREEK PURCHASE UNIT

LAWRENCE, GALLIA AND JACKSON COUNTIES
STATE OF OHIO





LEGEND

- White Pine not Protected: 70 A's.
- White Pine Initially Worked: None
- White Pine on Maintenance: None
- White Pine Infection: ▲



U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9

INDIANA PURCHASE UNITS

**PLEASANT RUN, LOST RIVER,
PATOKA AND LAFAYETTE UNITS**

PERRY, CRAWFORD, ORANGE, DUBOIS, MARTIN,
LAWRENCE, JACKSON, MONROE AND
BROWN COUNTIES

STATE OF INDIANA
2ND PRINCIPAL MERIDIAN

Office in Charge
U.S. Forest Service
Bedford, Indiana.

BLISTER RUST CONTROL ON INDIAN RESERVATIONS,
NORTH CENTRAL REGION FINANCIAL PROJECT BLR-7

Objective

The objective of the blister rust control program on Indian Reservations is to protect against blister rust all valuable white pine stands administered by the Indian Service. This involves initial and subsequent eradication of ribes from within infecting distances of white pine stands in order to bring such stands through to commercial maturity free from blister rust damage.

Memorandum of Understanding

Control work on Indian Reservation lands is performed through a Memorandum of Understanding between the U. S. Indian Service and the Bureau of Entomology and Plant Quarantine. The Indian Service is responsible for selecting the pine areas to be protected and the employment of labor and supervision. The Bureau of Entomology and Plant Quarantine is responsible for the preparing of work plans and maps, keeping records, making reports of work accomplished, training of labor and supervision, and checking the adequacy of the control work.

Protective Zone Widths

The control of white pine blister rust involves the removal of currant and gooseberry bushes, the alternate hosts, from within the pine stand and from the immediate surrounding area. In this report, currant and gooseberry bushes will be hereafter referred to as "ribes". Under most conditions a protective zone width of 900 feet is considered adequate. During recent years, studies have indicated that it is not necessary under certain conditions to maintain a full 900 feet protective zone width. Due to the effect of screening by vegetation, zone widths have been reduced in swamps and woods depending on the density of forest cover. The protective zone widths have now been reduced to approximately 50 feet in swamps, 300 feet in dense woods, 600 feet in open woods, but retaining the full 900 feet in open fields or meadow types. The screening effect of dense swamp growth hinders the dissemination of sporidia from infected ribes in the swamp to the pines in the upland. The movement of spores from swamps is further hindered by the fact that most swamps are heavily shaded and cool, therefore preventing the formation of rising air currents.

By reducing these zone widths the cost of eradication is considerably lessened. Ordinarily, one crew width along the edge of a swamp will be

adequate to prevent heavy infection of the adjoining pine stand. These reductions in zone widths may not give complete protection but will provide sufficient protection to bring a fully-stocked stand of pine through to commercial maturity.

Rust Conditions

General Status for 1943

Abundant rainfall and prolonged periods of high humidity were again evident in 1943. These conditions are conducive to the spread of blister rust since they offer optimum conditions for the development of the disease. These favorable conditions have been prevalent since 1937. Blister rust has spread and rapidly intensified, particularly in the northern portions of the three Lake States.

Blister rust has been found on white pine in all of the Reservations except the Sac-Fox in Iowa and Lac du Flambeau in Wisconsin. It was found on white pines for the first time in 1943 on the Grand Portage and Vermilion Reservations in Minnesota. Infected ribes have been found on all reservations except Sac-Fox and Lac du Flambeau. The earliest infection on Indian Reservations was found on the Menominee in 1918. Fortunately, ribes eradication was started in time and has continued on a sufficiently adequate basis to save large areas of white pine on all the Indian Reservations from excessive loss due to blister rust.

Significance of Present Rust Conditions

In order to better understand the significance of a small amount of pine infection in an unprotected stand, it is well to discuss briefly the development of infection. Three periods of development are recognized as follows: (1) Introductory Period; (2) Period of Intensification; and (3) Period of Climax.

(1) Introductory Period: This includes the period from initial pine infection to the time when approximately five percent of the pines are infected. It is characterized by relatively slow intensification of pine infection, with increasing numbers of pines becoming infected at three or four year intervals. Negligible damage except on very small pine is apparent. Depending on ribes conditions and other factors this period usually lasts from four to ten years.

(2) Period of Intensification: This is the period of the greatest number of cankers produced and of pines becoming infected. The percent of pines infected increases from about five percent to the approximate maximum of 90 to 95 percent. Waves of infection usually occur every year particularly in advanced stages. Death of pines increases most rapidly in the younger age classes and more slowly among the larger trees. This period varies from 5 to 15 years depending on volume of ribes, site, exposure, geographical and weather conditions.

(3) Period of Climax: This period may be described as one of saturation. The rust has reached its greatest concentration under existing conditions. The number of new cankers formed each year is smaller due to a

depressing amount of living pine foliage and defoliation of ribes by the rust before sporoidal production can take place. Thus, the gradual elimination by death of all white pine trees is complete to the degree that white pine is no longer an important part of the forest stand. Young white pines, as they are produced by germinating seed in the duff, are killed very rapidly, eventually eliminating even the source of seed from seed trees or that which is stored in the duff. The length of this period is indefinite. It continues as long as living pine foliage is present and the causative ribes factor remains. Studies of pine infection in this Region, particularly in northeastern Minnesota, indicate that on areas where ribes and white pine are closely associated the rust builds up so rapidly that in 5 to 15 years after the rust starts there is nearly complete pine infection and shortly thereafter, elimination of white pine from the forest stand.

Control Accomplishments in 1943

Ribes eradication in 1943 was performed initially on the Bad River and Menominee Reservations in Wisconsin. Re-eradication was performed on the Nett Lake and Vermilion Reservations in Minnesota and on the Bad River, Menominee and Lac Court Oreilles Reservations in Wisconsin. As noted in Text Table 10, 640 acres of control area were cleared initially of 29,768 ribes to protect 383 acres of pine at a cost of 404 man-days. The greatest amount of work in 1943 was performed as re-eradication. It will be noted that 4,949 acres of white pine thus were protected by the removal of 558,978 ribes from 6,940 acres of control area at a cost of 3,687 man-days.

All of this control work was performed on the basis of plans agreed upon by the Indian Service and the Blister Rust Control Organization. Indian labor was used entirely. For the first time, Indian women made up a high proportion of the Indian eradication crews. Indian men and women were used as crew foremen, and in general, the direct supervision of the work was handled by Indians. The Bureau of Entomology and Plant Quarantine provided technical direction and training to field men, made or revised necessary maps, checked the adequacy of control work, kept records of work done, and prepared the necessary reports.

In the selection of areas to be worked in 1943, great care was taken to make sure that the utmost in terms of pine protected would be obtained from labor expended. Those stands of young white pine of most value and in which the rust was intensifying at the most rapid rate were worked.

Checking

In Text Table 11, results of checking after ribes eradication in 1943 are shown. It is gratifying to note that the 5,418 acres worked and checked passed as satisfactory. That is, the check showed that ribes feet of live-stem averaged less than 25 per acre after eradication on all of the areas. The check showed ribes remaining after eradication at the rate of 3.78 bushes and 11.27 F.L.S. per acre.

General Status of Control

In Text Table 12, the status of blister rust control on Indian Reservations on December 31, 1943, is shown. The total white pine on Indian Reservations in the Region listed for protection amounts to 50,262 acres and involves a control area of 97,241 acres. Of this total acreage of pine, 42,438 acres or 84 percent have been initially protected, and 4,912 acres or approximately 10 percent are now on maintenance. It will be noted that initial work has now been completed on the Grand Portage, Vermilion and White Earth Reservations in Minnesota and on the Lac du Flambeau Reservation in Wisconsin. The major problem remaining includes re-eradication of ribes from a high proportion of the control area and the completion of initial eradication on a smaller portion.

In general, ribes are more abundant than the average on all Indian Reservation lands. The fact that such a high proportion of Indian white pine forests has been initially worked, and the absence of serious damage to white pines from blister rust, speaks very well for the effective manner in which the Indian Service has performed blister rust control.

Status of Control by Reservations

Sac-Fox Indian Reservation - Iowa

The Sac-Fox Indian Reservation located approximately in the center of the State of Iowa has 45 acres of planted pine with a control area of 500 acres. Ten acres with a control area of 206 acres were initially worked in 1934. Incidentally, white pine is making excellent growth on this reservation. Annual height growths of from three to four feet are not uncommon.

No blister rust infection has been found on the Reservation. Ribes infection, however, has been located in Tama County. Plans are being perfected for the initial working of 294 acres of control area to initially protect 35 acres of white pine on the Reservation. The number of man-days and actual plans for the work will be obtained as soon as possible in the spring of 1944.

Grand Portage Indian Reservation - Minnesota

This Reservation in northeastern Minnesota contains 361 acres of natural pine involving 432 acres of control area all of which has been initially worked. In the 1942 report, a 50-acre white pine plantation, commonly known as the Cascade White Pine Plantation on Pigeon River, was included in the control problem. A survey made in 1943 of this area showed very poor survival. Only approximately 12 white pines per acre were present. For this reason, the plantation was removed from the control area. There is, however, an estimated total of 1,500 acres of unsurveyed natural white pine not yet included in the control problem. No control work was performed in 1943.

Rust on white pine was reported for the first time on this Reservation in 1943. Occasional infected trees were found along the original Grand Portage Trail in Sections 25 and 27, T. 64N., R. 5E. Most of this infection appeared to have originated in the years 1937 to 1939. No local control work is planned for the Grand Portage Reservation during 1944.

Wett Lake Indian Reservation - Minnesota

There are approximately 6,041 acres of white pine, all but 60 acres natural, included in one control area of 8,588 acres. Most of this acreage lies in one large block south of Wett Lake. Of this total, 9,019 acres or 33 percent have been initially protected and 3.67% acres or nearly 60 percent are on maintenance. All of the acreage on maintenance was placed in that category as a result of work and surveys performed in 1943.

Blister rust on pines is general over the Reservation. Pine infection was found for the first time in 1942. Approximately 10 percent of the white pine is an unseeded plantation, established in 1937 and 1938, was found to be infected. Most of the infection found appeared to have originated in 1937. Only a small amount of scouting for the rust has been performed on the Reservation. It is believed that such scouting would show that pine infection is widely distributed and is intensifying rapidly in unprotected stands. Fortunately, the main body of the white pine has been protected initially, and it is believed that there will be no serious loss from the rust if this protected condition can be maintained.

A substantial blister rust control program was performed in 1943 by the removal of 97,805 ribs from 3,040 acres of control area to protect 2,798 acres of white pine at a cost of 842 man-days. This work was entirely re-eradication. Eradication laborers, Indian men and women of all ages, were secured from the Wett Lake Village. The best work was performed by the older women who were diligent workers and took an interest in their job. The poorest work was done by young girls and boys who did an unusual amount of talking while working. A large amount of turnover of workers resulted in the use of inexperienced Indian labor throughout the season.

The official check after eradication was made on 1,298 acres of the 3,040 acres worked. All of the acreage checked showed less than 15 feet of live-stem per acre, with an average of 3.09 bushes and 9.62 P.L.B. per acre after eradication.

Plans for 1944, worked out carefully in cooperation with Indian Service officials, call for the working of 408 acres at an estimated cost of 630 man-days. A good share of this recommended work is re-eradication, including that around a 40-acre white pine plantation established on a 1937 burn and initially seeded in 1938. The rework will be at least as heavy as initial eradication because of the heavy regeneration from stored ribs and coming up after the burn. The decision for doing the rework around this plantation, as agreed upon with the Indian Service officials, is based on several factors. There is no other equally valuable species to replace white pine if it is destroyed by the rust. Because there is a relatively small acreage of white pine reproduction on the Reservation, it is highly desirable to protect all young white pine stands.

Vermillion Indian Reservation - Minnesota

There are 72 acres of natural white pine with a control area of 186 acres on the Reservation. All of this has been initially worked several years ago.

During 1943 the entire 186 acres of control area were given second eradication by the removal of 28,859 ribs at a cost of 235 man-days. Ribs

were abundant on rework, averaging 155 per acre. Labor consisted of one crew of seven Indians, young girls and old men, under the leadership of a local straw boss. The crew worked slowly but performed thorough eradication work.

While ribes infection is general in this locality, pine infection was found for the first time near the western edge of the pine area in 1943. It is expected, however, that eradication has been sufficiently timely to prevent serious loss. No additional ribes eradication work is planned for 1944.

Red Lake Indian Reservation - Minnesota

No work was done on the Red Lake Indian Reservation during 1943 and the status of control remains the same as that shown in the 1942 report. This Reservation contains the largest amount of white pine of all the Reservations located in Minnesota. There are 12,570 acres of white pine listed as worth protecting of which all but 72 acres have been given initial protection. While only 1,120 acres of white pine are shown as being on maintenance, it is probable that surveys would classify additional acres of white pine in this category.

The main body of white pine lies on the peninsula projecting between Upper and Lower Red Lake. A considerable number of smaller areas, many of which are on a maintenance basis, are found immediately south of Lower Red Lake. Blister rust was first reported on both pine and ribes in the summer of 1933. Fortunately, initial local control work was performed that year and in subsequent years, thus forestalling damage to white pines which would have occurred had they not been protected in time.

No work is planned for the Red Lake Reservation in 1944. If opportunity permits, post-checking should be performed to determine when additional work is required to prevent ribes from returning in dangerous concentrations. It is believed, however, that necessary additional work on the Reservation can be postponed for a few years without serious loss to white pines.

White Earth Indian Reservation - Minnesota

No work was performed in 1943 and the status of control remains the same as that shown in the 1942 report. There are 495 acres of white pine on this Reservation, all of which has been initially protected and a considerable portion of it reworked. It is believed that the pine is adequately protected, at least for the present, although none of it is listed as being on maintenance. Pine infection was found for the first time in 1941.

No control work is scheduled for this Reservation in 1944. As time permits, post-checking would be desirable, to determine the present control status and to schedule for protection any areas needing re-eradication.

Bad River Indian Reservation - Wisconsin

There are 6,331 acres, almost entirely natural white pine, listed for protection involving 16,974 acres of control area. Of this total, 3,811 acres have been initially worked, leaving 2,520 acres on which initial work is needed. No white pine acreage on this Reservation has yet been placed on maintenance.

Scattered pine infection has been found on the Reservation. Most of

it is of recent origin, since 1938. An analysis of samples found indicates that pine infection is increasing very rapidly on unprotected areas. Ribes concentrations are heavy.

In 1943, a small amount of initial eradication was performed on 40 acres surrounding a plantation. A total of 22,291 ribes was removed at a cost of 109 man-days. The tremendous abundance of ribes is indicated by the fact that approximately 500 ribes per acre were pulled.

Re-eradication was the major work done in 1943. To protect 235 acres of pine, 293,384 ribes were removed from 430 acres of control area at a cost of 1,030 man-days. The extreme abundance of ribes on this Reservation is indicated by the fact that on second working, ribes were removed at the rate of nearly 700 per acre. The areas chosen for this work were selected cooperatively by the Indian Service and the Blister Rust Control Organization. Labor for work performed in 1943 consisted primarily of Indian women. These Indian women worked very well for the type of ribes eradication and country which had to be covered. Most of the ribes are of the prostrate type, requiring only a minimum of effort to pull out. According to the 1943 experience, the Indian women were unable to cover the ground quite so fast as men, but on the other hand, they did a more thorough job of ribes eradication. There was little absenteeism among the women and only a small amount of turnover in employment.

While the entire acreage worked was not officially checked, the 270 acres that were worked and checked showed less than 15 feet of live-stem per acre, with an average of 6.3 bushes and 12.1 F.L.S. per acre. Considering the large number of ribes on this Reservation, the checking results show good eradication work.

The work program proposed for the fiscal year 1944 includes three areas involving initial and re-eradication effort on 1,693 acres to protect 1,070 acres of white pine at an estimated cost of 1,659 man-days. It is probable that Indian women will be as available for ribes eradication work in the fiscal year 1945 as they were in the field season of 1943.

Menominee Indian Reservation - Wisconsin

The Menominee Indian Reservation contains the largest amount of white pine of all the reservations in this Region. There are approximately 19,955 acres of white pine listed for protection, involving 35,512 acres of control area. Of this total pine acreage, 15,893 acres, or 80 percent have been given initial protection. Owing to the general abundance of ribes, no acreage has yet been placed on maintenance. Approximately 17,500 acres of white pine are in the reproduction or sapling classes, and the remaining acreage is mostly pole and mature timber lacking advanced reproduction. The acreage increase, resulting from natural seeding in, continues to exceed the annual cut and losses from fire.

A large-scale ribes eradication program was performed in 1943, including both initial and re-eradication work. Under initial working, 370 acres of natural white pine were protected by removing 7,470 ribes from 600 acres of control area at a cost of 295 man-days. Under re-eradication, 1,370 acres of natural pine, in four areas, were protected by removing 140,224 ribes from 2,508 acres of control area at a cost of 1,603 man-days. The areas

worked in 1943 were selected by the Indian Service in close cooperation with the Blister Rust Control Organization, in order that most returns in terms of young pine protected would result from labor expended.

For the first time, Indian women were used almost exclusively as ribes eradicators. The control program was administered by Forest Supervisor John Libby in close cooperation with the Wisconsin District Leader. An Indian, Al Lyons, was placed in charge of field work. He was assisted by a sub-foreman, Levi Warrington. Indian women made up the ribes eradication crews, including both laborers and crew foremen. Peak employment of 50 to 55 women was reached during June. Women hired for ribes eradication work varied in age from 16 to 60 years, with most of them in the 20 to 30 year age group. They proved extremely conscientious workers with a high morale and a full knowledge of the value of the work they were doing. While a certain amount of turnover in employment occurred, it is believed that this was not as great as in the past when Indian men were used. A big advantage in the use of women lay in the fact that there was not the usual two or three days of layoff from work which has often followed paydays in the case of Indian men.

The systematic check on acreage worked in 1943 showed that all of the work done was satisfactory. There was an average of 4.9 bushes and 16.2 F.L.S per acre remaining after eradication.

The Menominee Indian Reservation represents an excellent example of the value of timely and adequate ribes eradication throughout the past years. Pine infection was found on this Reservation as early as 1918. Ribes are abundant and grow in close association with white pines. Weather conditions are favorable for the rust. The stage was set for a wholesale destruction of young white pine trees on the Reservation to the point where white pine would cease to be a tree of commercial importance if no control work had been done. However, not only was blister rust control work performed as early as 1918 around the points where infection was then found, but reasonably sustained ribes eradication work has been done ever since. As a result, white pine reproduction is coming up on protected areas in a very satisfactory manner. According to surveys and estimates, the acreage increase of white pine resulting from natural seeding continues to exceed the annual cut and loss from fire. Since forest management on the Menominee Indian Reservation is predicated on a sustained yield basis, it is important that the annual growth of white pine continues to exceed its annual cut.

A work plan for the fiscal year 1945 has been prepared and approved jointly by the Indian Service Forest Supervisor and the Blister Rust Control Organization. Due to results of subsequent post-check and resurveys, there has been a slight revision of the original work plan. The revised plan calls for the initial protection of 987 acres of white pine on five areas, by removing ribes from 1,785 acres at an estimated cost of 975 man-days. Under re-eradication it is proposed to protect 779 acres of white pine on four areas, by removing ribes from 1,705 acres at an estimated cost of 1,015 man-days. A field map and recommendations have been supplied the Indian Service Forest Supervisor for each of the above areas.

It is probable that Indian women again will be employed on ribes eradication. A total of 26 workers for five months will be needed to furnish the man-days as estimated.

Lac du Flambeau Indian Reservation - Wisconsin

On this Reservation there are approximately 2,636 acres of pine, involving 7,852 acres of control area. All but 115 acres of pine have been given initial working.

Control work in 1943 involved only re-eradication on 776 acres to protect 674 acres of white pine by removing 2,526 ribes at a cost of 177 man-days. Field work was performed from about the first part of August to the middle of September. It was difficult to get labor during the time of cherry picking and the harvesting of beans and berries on the Reservation. No attempt was made to use women or boys of school age on blister rust control work.

Although white pine blister rust has spread rapidly in the general vicinity of the Reservation, it is encouraging to note that practically no pine infection has been found on the Reservation itself. This healthy condition can be attributed to the fact that approximately 85 percent of the pine was initially protected by the end of 1934, and 95 percent by the end of 1939. Ribes infection has been found generally throughout the Reservation, but if worthwhile pine stands are continued in a protected status, there will be no serious loss from the rust.

Work plans for the fiscal year 1945, agreed upon between the Indian Service and the Blister Rust Control Organization, include re-eradication on six areas involving the removal of ribes from 2,917 acres at an estimated cost of 645 man-days to protect 1,052 acres of pine. While a limited amount of initial work remains to be done on this Reservation, such acreage is chiefly mature and scattered pine and is not included in the 1945 work program. Ribes eradication in such stands will be recommended after the mature pines are out and sufficient white pine reproduction has become established to make protection desirable.

Lac du Flambeau Indian Reservation - Wisconsin

No work was performed in 1943 and none is recommended for 1944 on this Reservation. There are 1,956 acres of natural white pine, involving a control area of 6,227 acres. All of this white pine has been given initial working. While none of it is on maintenance, the reason is primarily that post-checking has not been done here.

At the present time no infection on either white pine or ribes has been found. It is probable, however, that careful inspections throughout the Reservation would show the rust to be present.

The chief work at the present time needed on this Reservation is post-checking, in order to determine what areas can be placed on maintenance and what areas require additional working. From previous knowledge of conditions, it is probable that there is not the immediate need for ribes eradication here as there is on other reservations in the Region.

Expenditures

Expenditures for ribes eradication by Indian Reservations and

sources of funds for 1943 are shown in Text Table 13. Regular Indian Service 3107 funds were spent on five reservations in the total amount of \$13,079.16. In addition, \$5,533.49 of Menominee Indian Tribal funds were used in local control, making a total of \$18,602.65, furnished by the Indian Service. In addition, chiefly for mapping, surveying, etc., on Indian Service lands, Regular Bureau of Entomology and Plant Quarantine funds were spent in the amount of \$1,319.96. These Bureau expenditures are over and above the contributions for technical supervision, checking, keeping of records, etc., furnished by the Bureau as part of its responsibilities.

Recommendations for 1944

Specific recommendations are given in discussions of the work on each reservation. In addition, work plans and budgets prepared cooperatively between the representatives of the Indian Service and the Blister Rust Control Organization have been supplied.

In general, work recommended for the fiscal year 1945 is shown for those areas most immediately in need of such working after taking into full consideration the availability of labor. Following the successful use of Indian women on ribes eradication in 1943, it is probable that continued use of this type of labor will be made in 1945.

Excellent stands of white pine are found on the Indian Reservations. Some of the best virgin white pine remaining in this Region is found on the Menominee Reservation. On practically all of the reservations, white pine reproduction, particularly in recent years, is seeding in naturally in gratifying amounts. Ribes conditions, generally speaking, are decidedly heavier on the reservations than the average for the Region. Blister rust infection on both pines and ribes has been known to exist either on or close to the reservations for a good many years. Thus, if no blister rust control work had been performed, white pine in commercial forests for the future would have been precluded because necessary white pine reproduction would have been destroyed by blister rust before it reached maturity.

However, due to the timely and continued protection against blister rust of these young stands, performed cooperatively between the Indian Service and the Blister Rust Control Organization, there are at present no large areas in Indian Service ownership on which serious loss from the rust has occurred. Plans for the fiscal year 1945, for continuing most immediately needed control work, are part of an intelligent over-all plan to assure the continued production of white pine without serious loss from blister rust.

Text Table 11. Results of Checking After Ribes Eradication on Indian Service Lands, 1943

Indian Reservation	Classification of Worked Areas									
	Checking After Eradication					On Basis of Ribes F. L. S. Remaining After Eradication				
	No. Areas	Acres Worked	Strip Acres	Ribes Found Bushes	Ribes per Acre F. L. S.	Bushes F. L. S.	0.0 to 15.0 F. L. S. Acres	15.1 to 25.0 F. L. S. Acres	25.1 to 50.0 F. L. S. Acres	50.1 to 100.0 F. L. S. Acres
Beth Lake, Minn.	6	1,298a	9.72	30	93.5	3.09	9.62	1,298	-	-
Verdilion, Minn.	2	186	3.56	12	27.5	3.37	7.72	186	-	-
Sad River, Wis.	2	270b	6.30	40	76.1	6.30	12.10	270	-	-
Mendota, Wis.	4	2,888c	28.30	139	458.0	4.90	16.20	600	2,288	-
Les Court Orellles, Wis.	1	776	13.20	20	33.3	0.80	2.90	776	-	-
Total	15	5,418	61.08	231	668.4	3.78	41.27	3,130	2,288	-

a - 3 acres with 1,742 acres, not officially checked.

b - 1 acre with 200 acres, not officially checked.

c - 1 acre with 220 acres, not officially checked.

Text Table 12. Status of Blister Rust Control on Indian Reservations to December 31, 1943

Indian Reservation	Total Control Problem					Net Acres			Net Acres Not Initially Worked			Net Acres on Maintenance		
	Net Acres					Initially Planted			Total			White Pine		
	Total					Natural			Control			Control		
	Pine	Planted	Total	Pine	Area	Pine	Pine	Area	Pine	Area	Area	Pine	Pine	Area
<u>Iowa</u>														
Sac-Fox		45	45		500		10	10	206	35	234			
<u>Minnesota</u>														
Grand Portage	361		361		432	361			432					
Nett Lake	5,981	60	6,041		8,588	4,971	48	5,019	6,904	1,022	1,684	3,674		5,019
Red Lake	12,311	259	12,570		19,800	12,311	187	12,498	19,562	72	238	1,120		2,820
Vermilion	72		72		186	72		72	186					
White Earth	477	18	495		1,163	477	18	495	1,163					
Sub-total	19,802	337	19,539		30,169	18,192	253	18,445	28,247	1,034	1,922	4,794		7,839
<u>Wisconsin</u>														
Bad River	6,318	13	6,331		16,974	3,798	13	3,811	7,465	2,520	9,509			
Menominee	19,621	334	19,955		35,512	15,559	334	15,893	27,251	4,062	8,261			
Lac Courtois Oreilles	2,008	428	2,436		7,859	1,895	428	2,323	7,500	113	359	118		503
Lac du Flambeau	1,956		1,956		6,227	1,956		1,956	6,227					
Sub-total	29,903	775	30,678		66,572	23,208	775	23,983	46,443	6,695	18,189	118		543
Grand Total	49,105	1,157	50,262		97,241	41,400	1,038	42,438	76,896	7,824	20,145	4,912		8,379

Text Table 13- Costs of Ribes Eradication, Indian Reservations,
North Central Region, 1943

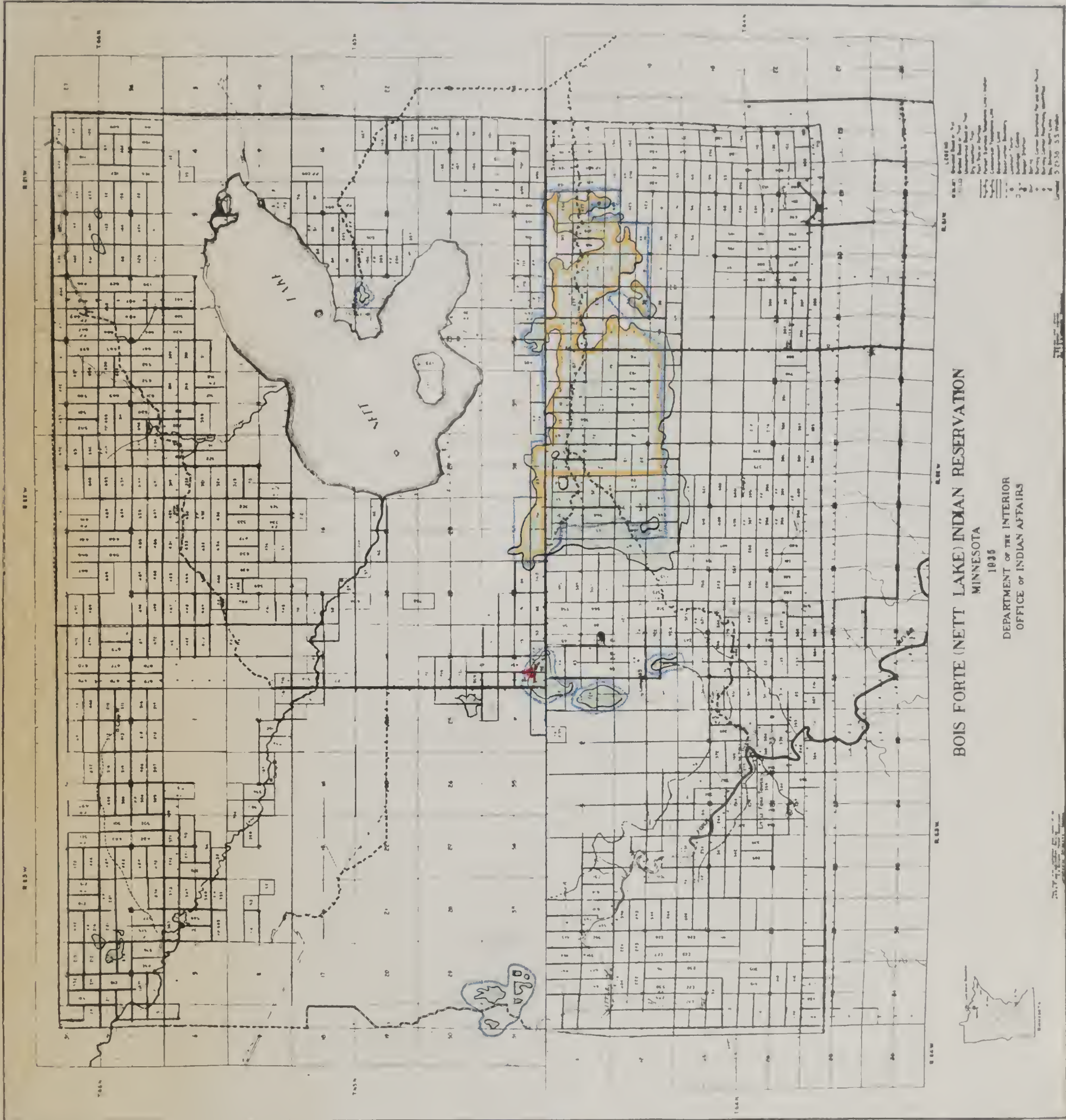
Indian Reservation	Indian Service Control			Bureau Control		
	Regular 3107	Tribal	Total	Regular 3101	State	Total
Nett Lake, Minnesota	\$2,988.40	-	Local Control \$2,988.40	-	-	\$2,988.40
Vermilion, Minnesota	1,005.81	-	1,005.81	-	-	1,005.81
Bad River, Wisconsin	4,325.82	-	4,325.82	-	-	4,325.82
Lac Court Oreilles, Wisconsin	732.81	-	732.81	-	-	732.81
Menominee, Wisconsin	3,998.56	\$5,523.49	9,522.05	-	-	9,522.05
Sub-total, Local Control	12,051.40	5,523.49	18,574.89	-	-	18,574.89
Nett Lake, Minnesota	27.76	-	Mapping, Surveys, etc. 27.76	-	-	27.76
Bad River, Wisconsin	-	-	-	326.66	-	326.66
Lac Court Oreilles, Wisconsin	-	-	-	158.33	-	158.33
Menominee, Wisconsin	-	-	-	374.99	\$460.00	834.99
Sub-total, Mapping, Surveys, etc.	27.76	-	27.76	859.98	460.00	1,319.98
Grand Total, All Work						1,347.74
Nett Lake, Minnesota	3,016.16	-	All Work 3,016.16	-	-	3,016.16
Vermilion, Minnesota	1,005.81	-	1,005.81	-	-	1,005.81
Bad River, Wisconsin	4,325.82	-	4,325.82	326.66	-	326.66
Lac Court Oreilles, Wisconsin	732.81	-	732.81	158.33	-	158.33
Menominee, Wisconsin	3,998.56	5,523.49	9,522.05	374.99	460.00	834.99
Grand Total, All Work	13,079.16	5,523.49	18,602.65	859.98	460.00	1,319.98
						19,922.63

White Pine Infection

Acres White Pine Initially Worked

Acres White Pine on Maintenance 3674

Acres White Pine Not Protected 1022

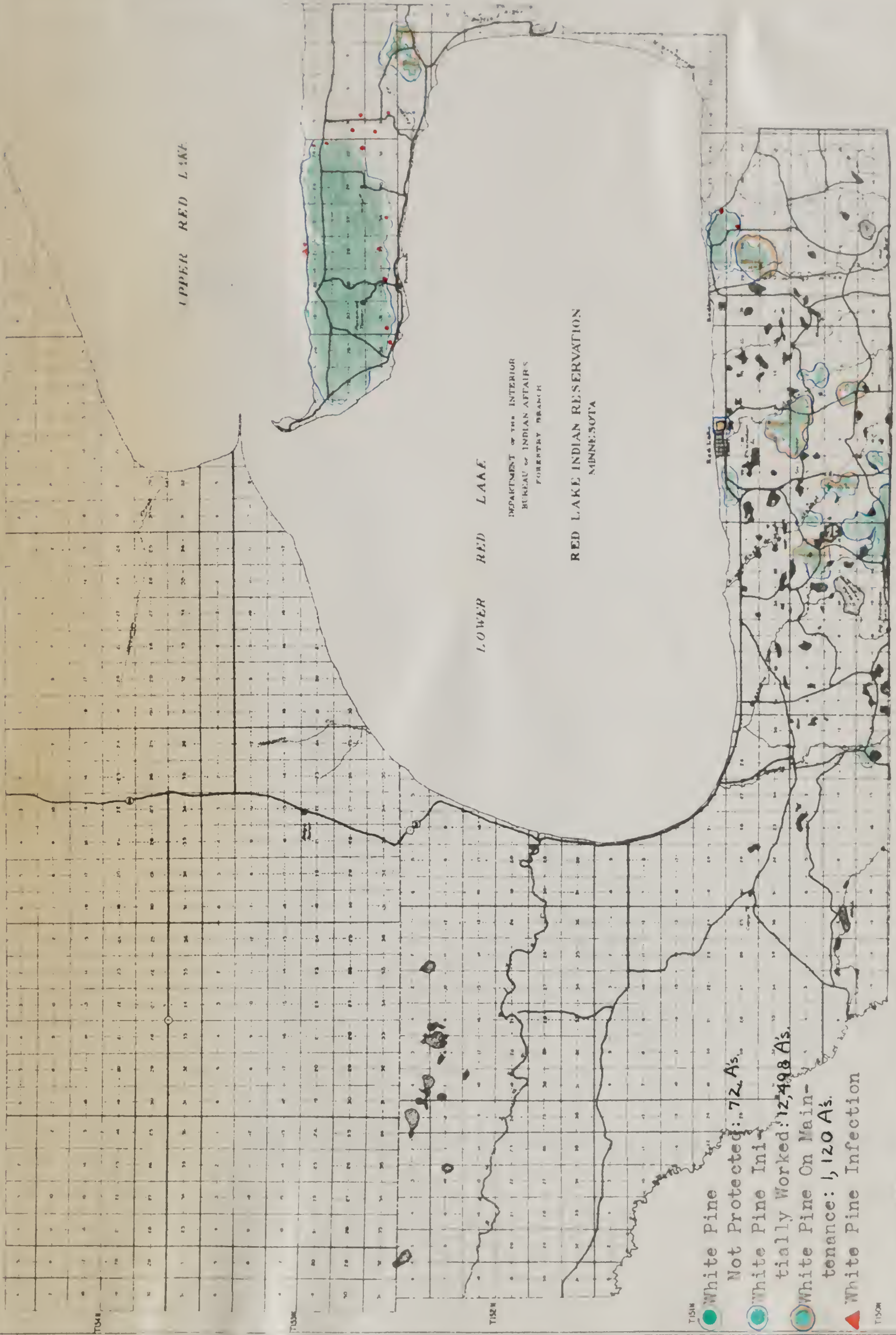


1022 Acres White Pine not Protected

3674 Acres White Pine on Maintenance

5019 Acres White Pine Initially Worked

White Pine Infection



P 16W

25

24

VERMILION LAKE

T62N

EVERETT'S BAY

72

33

Acres White Pine Initially Worked

White Pine Infection



LEGEND

- ASP ASPEN
- ALB ALDER
- BAL BALDAM
- BIE BIRCH
- BIG BALM OF GILGAD
- CE CEDAR
- CL CLEARING
- JP JACK PINE
- MP NORWAY PINE
- WR WHITE PINE
- SPR SPRUCE
- TAM TAMARACK
- REP REPRODUCTION
- B DWELLING
- TRAIL
- TIMBER OUTLINE
- BAR BEETLE ATTACK
- OPEN SWAMP
- OBSERVATION BOUNDARY
- TELEPHONE LINE
- ROAD
- FIRE LAKE

VERMILION LAKE INDIAN RESERVATION

LEGEND

- PAVED & TUNNED HIGHWAYS
- GRAVELED ROADS
- DIRT ROADS
- FEDERAL STATE HIGHWAYS
- COUNTY ROADS
- TOWNSHIP ROADS
- INDIAN ROADS
- FORESTRY TRAILS
- RESERVATION BOUNDARY
- SCHOOLS
- RAILROADS
- PROPOSED PROJECTS
- INDIAN ALLOTMENTS
- OLD TRAILS
- COUNTY BOUNDARIES
- TWIN LAKES RESETTLEMENT

ROAD MAP OF
WHITE EARTH INDIAN RESERVATION

MINNESOTA

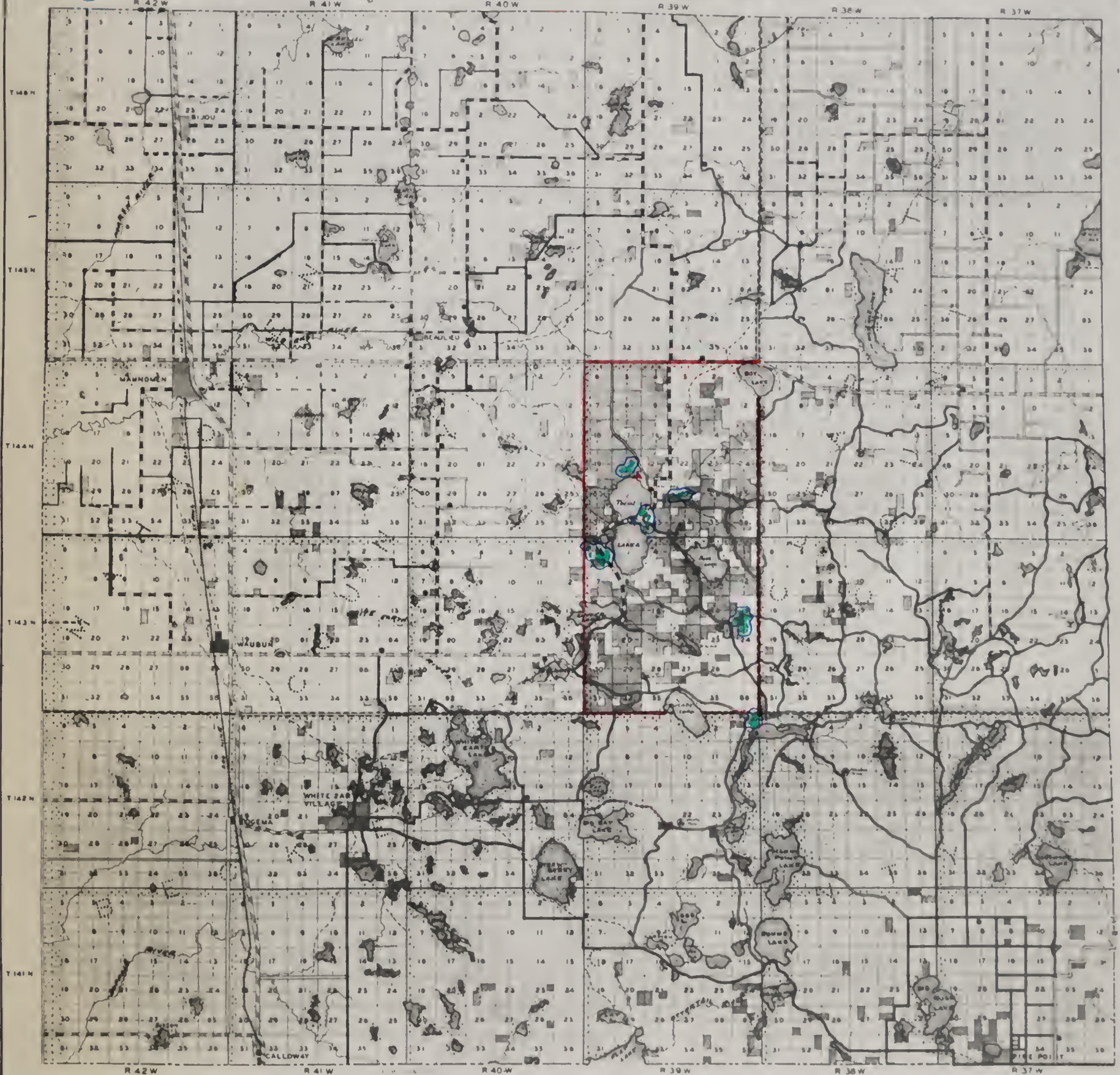
1937

DEPARTMENT OF THE INTERIOR
OFFICE OF INDIAN AFFAIRS

SCALE



- White Pine Not Protected: None
- White Pine On Maintenance: None
- White Pine Initially Worked: 495 A.
- ▲ White Pine Infection



ROAD DEPARTMENT
CONSOLIDATED CHIPPEWA AGENCY
CASS LAKE MINNESOTA

O PONSFORD

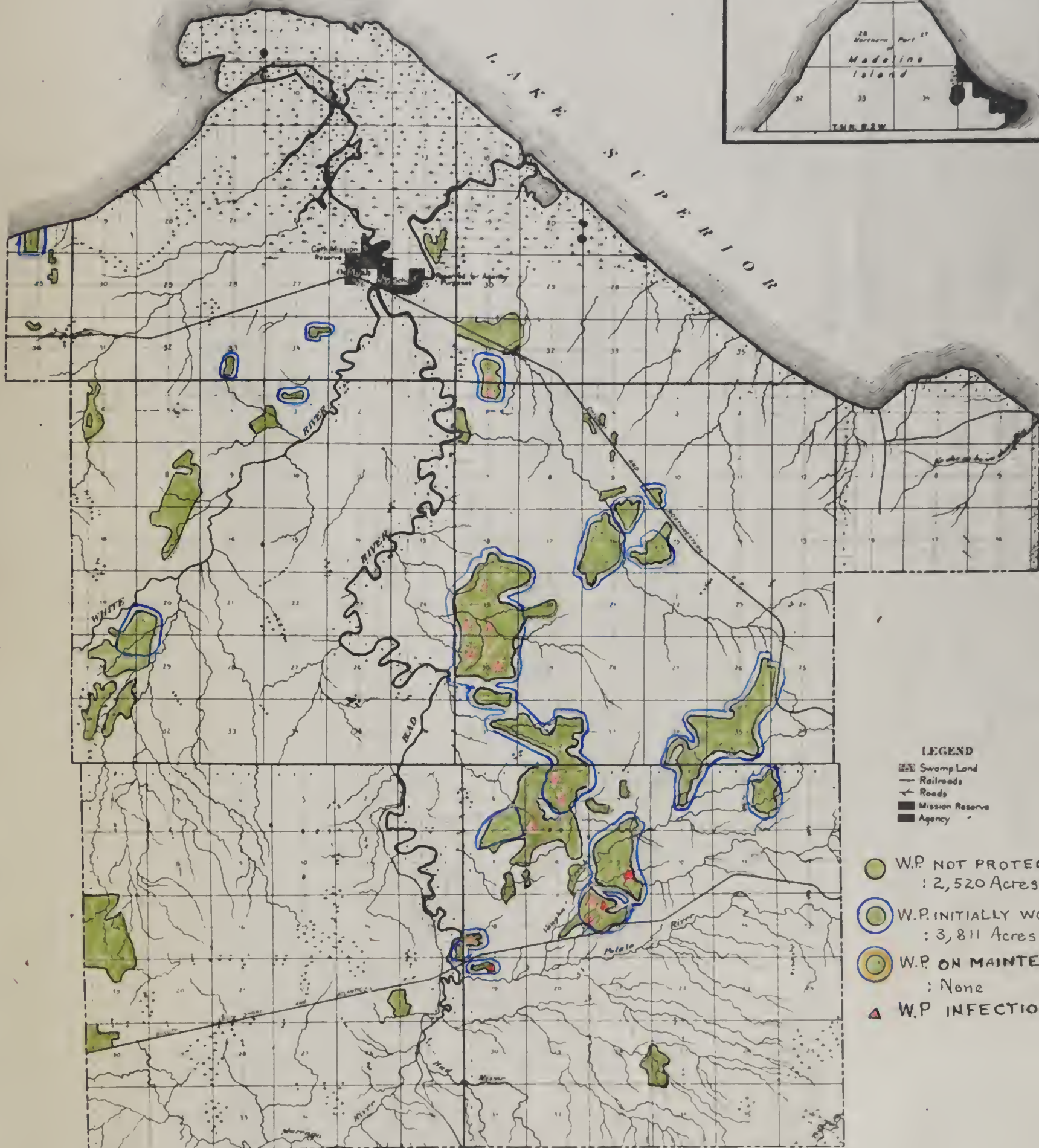
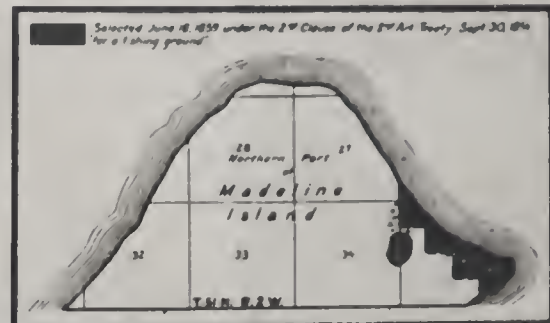
MAP OF BAD RIVER INDIAN RESERVATION WISCONSIN



DEPARTMENT OF THE INTERIOR
OFFICE OF INDIAN AFFAIRS

Ben H. Valentine, Commissioner

Scale of Miles



LEGEND

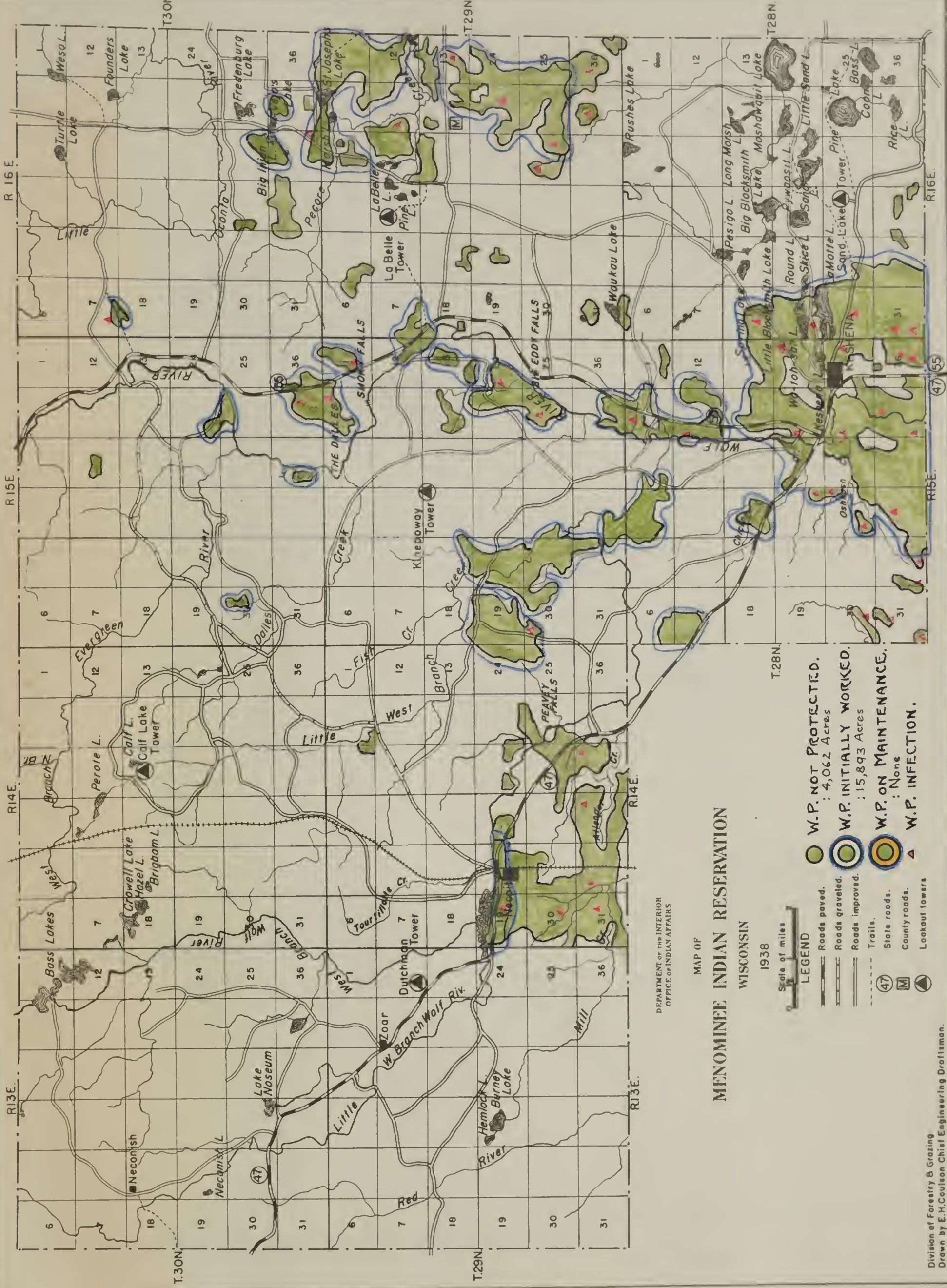
- Swamp Land
- Railroads
- Roads
- Mission Reserve
- Agency

W.P. NOT PROTECTED.
: 2,520 Acres

W.P. INITIALLY WORKED.
: 3,811 Acres

W.P. ON MAINTENANCE.
: None

W.P. INFECTION.



MAP OF
MENOMINEE INDIAN RESERVATION
WISCONSIN

1938

Scale of miles

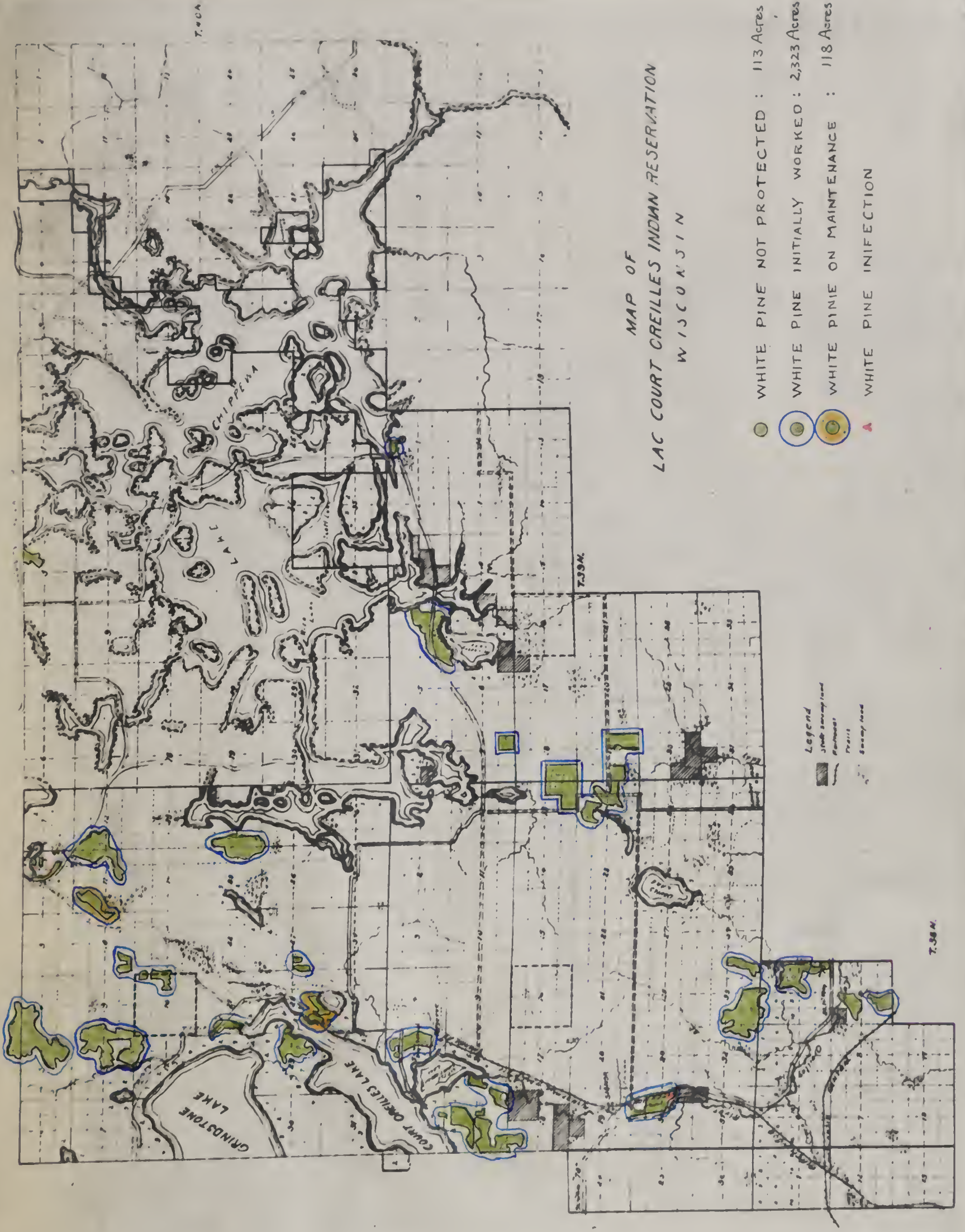
LEGEND

- W.P. NOT PROTECTED.
: 4,062 Acres
- W.P. INITIALLY WORKED.
: 15,893 Acres
- W.P. ON MAINTENANCE.
: None
- W.P. INFECTION.
- Roads paved.
- Roads graveled.
- Roads improved.
- Trails.
- State roads.
- County roads.
- Lookout towers

R.6W

R.5W

R.3W



MAP OF
LAC COURT OREILLES INDIAN RESERVATION
WISCONSIN

- WHITE PINE NOT PROTECTED : 113 Acres
- WHITE PINE INITIALLY WORKED : 2,323 Acres
- WHITE PINE ON MAINTENANCE : 118 Acres
- WHITE PINE INFESTION

Legend
3000' swamp land
4000' swamp land
5000' swamp land

T.36N

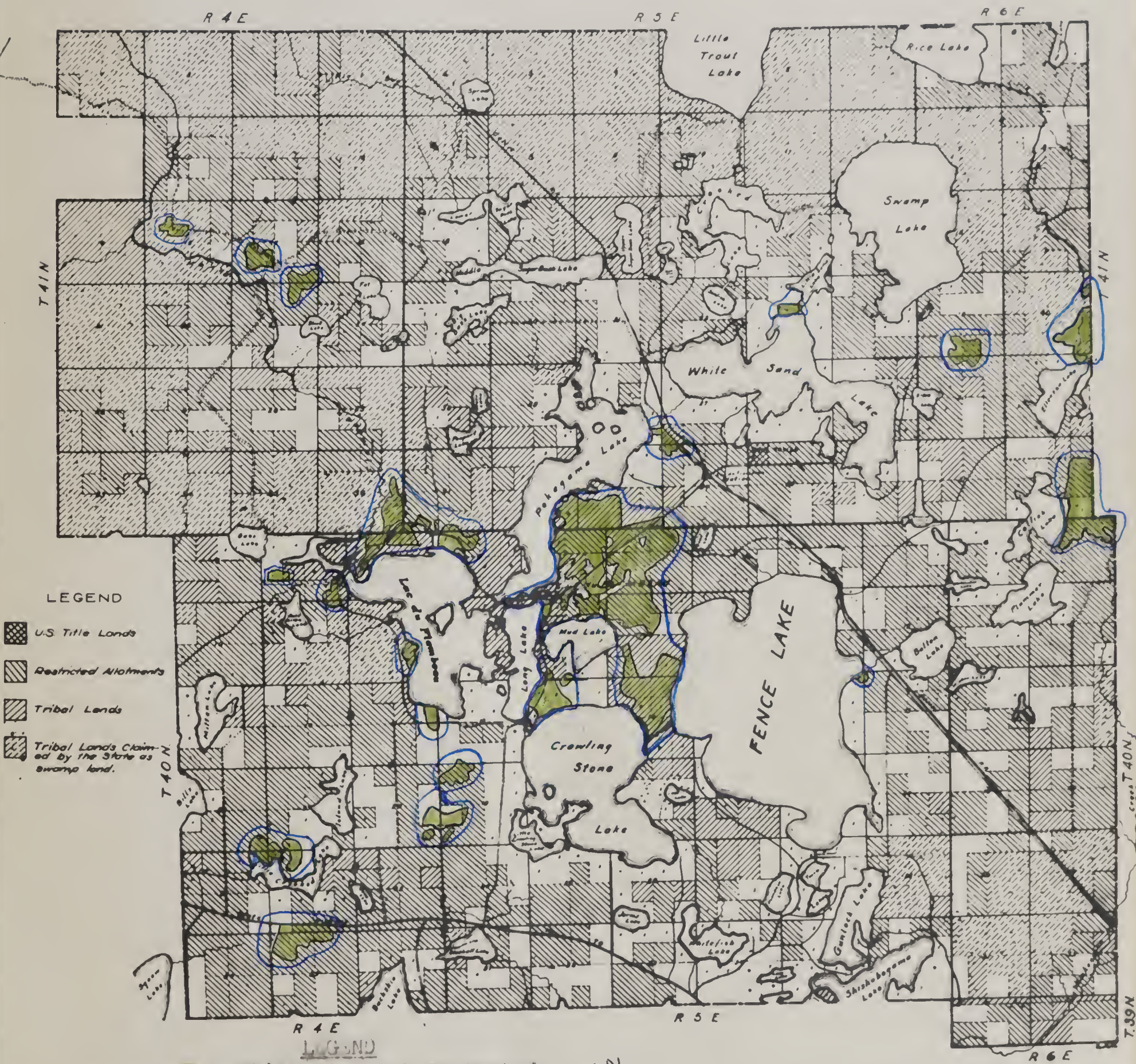
T.35N

T.34N

LAC DU FLAMBEAU INDIAN RESERVATION

WISCONSIN
1933

Scale of 1/2 miles



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Table 1. Surveys Performed in North Central Division, 1963

State	Type of Survey	Gross Acres Sounded		Net Acres Sounded		Non-Surveyed La. Parishes
		White Pine	Control Area	White Pine	Control Area	
Illinois	Pre-eradication	219	1,199	219	1,199	16
	Resurvey	1,063	6,941	951	3,960	28
	Total	1,282	8,140	1,170	5,159	44
	Pre-eradication	256	8,106	256	8,106	30
	Pre-eradication	3,117	21,111	3,117	21,111	123
Indiana	Resurvey	3,279	7,831	2,469	3,902	38
	Post-check	25,702	52,561	19,591	46,272	130
	Total	31,248	82,502	24,356	74,283	171
	Advance Check	6,743	13,111	6,109	9,111	30
	Pre-eradication	266	1,227	223	374	14
Mississippi	Post-check	4,109	11,816	3,308	7,956	80
	Total	11,198	25,389	9,640	17,441	79
	Pre-eradication	1,742	39,090	1,312	36,090	20
	Pre-eradication	5,351	15,574	5,353	15,574	25
	Resurvey	268	1,856	138	669	2
Tennessee	Post-check	13,240	42,163	11,819	33,527	81
	Total	14,982	55,053	12,400	49,243	109
	Advance Check	6,743	13,111	6,109	9,111	30
	Pre-eradication	11,853	88,810	11,816	86,757	311
	Resurvey	4,630	13,998	2,601	6,530	48
Region Total	Post-check	44,131	117,542	34,751	87,761	241
	Total	67,277	158,124	50,371	130,159	365

Table 2. Summary of Local Control by States and Agencies, North Central Region, 1943

State	Work Agency	Number Areas	Acres White Pine Protected		Acres Worked	Number Ribes Pulled	Total 8-Hour Man-Days Used
			Natural	Planted			
Initial Eradication							
Illinois	Reg.-Coop.	6	-	134	133	14,565	183
Indiana	Reg.-Coop	35	-	167	167	25,116	112
Iowa	Reg.-Coop	33	4	25	10	17,534	103
Michigan	Reg.-Coop.	129	2,543	1,467	4,010	86,293	672
	Bur.-Reg.	7	228	331	559	10	5
	F. S.-Reg.	2	60	-	60	7,388	127
	F.S.-CPS	6	-	403	403	5,621	26
	Total	164	2,831	2,201	5,032	111,888	830
Minnesota	Reg.-Coop.	2	135	-	135	5,095	265
	F. S.-Reg.	46	6,535	-	6,535	384,677	2,379
	Total	48	6,670	-	6,670	389,772	2,644
Ohio	Reg.-Coop.	29	-	423	423	29,679	255
	State CPS	1	-	210	210	10,271	188
	Total	30	-	633	633	39,950	443
Wisconsin	Reg.-Coop.	42	4,441	658	5,099	111,895	873
	I.S.-Reg. and Tribal	2	370	13	383	29,761	404
	Total	44	4,811	671	5,482	141,656	1,277
Region	Reg.-Coop.	254	7,123	2,874	9,997	321,495	2,469
	Bur.-Reg.	7	228	331	559	10	5
	F. S.-Reg.	48	6,595	-	6,595	392,065	2,506
	I.S.-Reg. and Tribal	2	370	13	383	29,761	404
	C.P.S.	7	-	613	613	15,892	214
Region Total		318	14,316	3,851	16,167	759,823	5,590

(Cont'd)

Table 2. (Cont'd) Summary of Local Control by States and Agencies, North Central Region, 1943

State	Work Agency	Number Areas	Acres White Pine Protected		Acres Worked	Number Ribes Pulled	Total 8-Hour Man-Days Used
			Natural	Planted			
Re-radiation							
Illinois	Reg.-Coop.	3	92	317	1,100	57,479	601
Iowa	Reg.-Coop.	124	-	57	515	12,035	102
Michigan	Reg.-Coop.	60	3,935	994	15,774	141,477	925
	F. S.-Reg.	7	213	516	1,880	139,207	705
	F. S.-CPS	3	50	614	1,406	1,554	20
	Total	70	4,198	2,124	19,060	282,240	1,650
Minnesota	Reg.-Coop.	7	567	2	821	28,641	187
	F. S.-Reg.	29	825	2,016	5,056	175,669	1,582
	I. S.-Reg.	11	2,855	15	3,226	122,744	877
	Total	47	4,247	2,033	9,103	307,054	2,646
Ohio	Reg.-Coop.	5	-	538	5,728	628	11
Wisconsin	Reg.-Coop.	35	5,992	594	18,069	94,108	1,070
	F. S.-Reg.	3	-	2,050	3,075	69,480	696
	I.S.-Reg. and Tribal	7	1,740	339	3,714	436,234	2,810
	Total	45	7,732	2,983	24,858	560,822	4,576
Region	Reg.-Coop.	212	10,586	2,552	40,289	357,081	3,202
	F. S.-Reg.	39	1,038	4,582	10,011	384,356	2,983
	I.S.-Reg. and Tribal	18	4,595	354	6,940	558,978	3,687
	F.S.-CPS	3	50	614	1,406	1,554	20
Region Total		272	16,269	6,108	58,646	1,301,969	9,892

(Cont'd)

State	Work Agency	Number Areas	Acres White Pine Protected			Acres Worked	Number Ribes Pulled	Total 8-Hour Man-Days Used
			Natural	Planted	Total			
Initial and Re-eradication								
Illinois	Reg.-Coop.	9	92	450	542	2,123	134,035	790
Indiana	Reg.-Coop.	13	-	167	167	1,522	36,114	112
Iowa	Reg.-Coop.	137	4	53	57	777	18,178	211
Michigan	Reg.-Coop.	189	6,478	2,461	8,939	33,357	227,770	1,597
	Bur.-Reg.	7	228	331	559	2,070	10	5
	F. S.-Reg.	9	273	516	789	2,145	146,595	832
	F. S.-CPS	9	50	1,017	1,067	2,746	7,175	46
	Total	214	7,029	4,325	11,354	40,318	381,550	2,150
Minnesota	Reg.-Coop.	9	702	2	704	1,055	33,736	752
	F. S. Reg.	75	7,360	2,016	9,376	14,080	560,346	3,961
	I. S.-Reg.	11	2,855	15	2,870	3,226	122,744	877
	Total	95	10,917	2,033	12,950	18,361	716,826	5,590
Ohio	Reg.-Coop.	32	-	1,011	1,011	6,715	30,181	266
	State-CPS	1	-	210	210	870	10,271	188
	Total	33	-	1,221	1,221	7,585	40,452	454
Wisconsin	Reg.-Coop.	77	10,433	1,252	11,685	31,104	206,003	1,943
	F. S.-Reg.	3	-	2,050	2,050	3,075	69,480	696
	I. S.-Reg. and Tribal	9	2,110	352	2,462	4,354	465,995	3,214
	Total	89	12,543	3,654	16,197	38,533	711,478	5,953
Region	Reg.-Coop.	466	17,709	5,426	23,135	76,653	678,576	5,671
	Bur.-Reg.	7	228	331	559	2,070	10	5
	F. S.-Reg.	87	7,633	4,582	12,215	19,300	776,421	5,489
	I. S.-Reg. and Tribal	20	4,965	367	5,332	7,580	588,739	4,091
	C. P. S.	10	50	1,227	1,277	3,616	17,446	234
Region Total		590	30,535	11,933	42,468	109,219	2,061,192	15,190

- a. Includes 5 cultivated Ribes.
b. Includes 688 cultivated Ribes
c. Includes 22 cultivated Ribes
d. Includes 302 cultivated Ribes.
e. Includes 1,017 cultivated Ribes.

Table 2A. Summary of Local Control by States and Ownership Classes, North Central Region, 1913

State	Ownership Class	Number of Acres	Acres White Pine Protected			Acres Worked	Number Elms Pulled	Total 8-Hour Man-Days Used
			Natural	Planted	Total			
Initial Eradication								
Illinois	Private	5	-	133	133	723	146,565	184
Indiana	Private	13	-	167	167	1,522	20,614	112
Iowa	Non-Fed. Public	1	4	-	4	14	6,967	46
	Private	32	-	26	26	220	6,587	57
	Total	33	4	26	30	234	13,554	103
Michigan	Forest Service	15	288	734	1,022	3,675	13,019	158
	Non-Fed. Public	24	808	370	1,178	3,593	13,235	54
	Private	105	1,735	1,097	2,832	13,990	73,058	618
	Total	144	2,831	2,201	5,032	21,258	99,312	830
Minnesota	Forest Service	46	6,535	-	6,535	9,024	304,677	2,379
	Non-Fed. Public	2	135	-	135	234	5,095	265
	Total	48	6,670	-	6,670	9,258	309,772	2,644
Ohio	Non-Fed. Public	2	-	220	220	1,270	13,184	232
	Private	28	-	413	413	2,603	26,766	211
	Total	30	-	633	633	3,873	39,950	443
Wisconsin	Indian Service	2	370	13	383	840	29,781	134
	Non-Fed. Public	8	1,544	506	2,050	4,132	29,170	236
	Private	34	2,897	152	3,049	8,903	82,725	637
	Total	44	4,811	671	5,482	13,875	114,656	1,277
Region	Forest Service	61	6,823	744	7,567	12,899	397,696	2,611
	Indian Service	2	370	13	383	840	29,781	134
	Non-Fed. Public	37	2,491	1,096	3,587	9,273	67,651	835
	Private	218	4,632	1,988	6,620	27,961	261,115	1,821
Region Total		318	14,316	3,831	18,147	50,573	759,223	5,999

(Cont'd)

Table 2A (Cont'd) Summary of Local Control by States and Ownership Classes, North Central Region, 1943

State	Ownership Class	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Pulled	Total 8-Hour Man-Days Used	
			Natural	Planted				
								Re-radiation
Illinois	Non-Fed. Public	3	52	317	409	1,400	67,470	
Iowa	Private	104	-	57	57	513	4,885	
Michigan	Forest Service	10	263	1,130	1,393	3,286	140,761	
	Non-Fed. Public	8	988	476	1,464	4,180	24,959	
	Private	52	2,947	518	3,465	11,594	116,518	
	Total	70	4,198	2,124	6,322	19,060	232,238	
Minnesota	Forest Service	29	825	2,016	2,841	5,036	175,669	
	Indian Service	11	2,855	15	2,870	3,226	122,744	
	Non-Fed. Public	6	567	-	567	788	28,131	
	Private	1	-	2	2	33	510	
Ohio	Total	47	4,247	2,033	6,280	9,103	327,054	
	Non-Fed. Public	1	-	534	534	3,528	2	
	Private	2	-	54	54	184	500	
Wisconsin	Total	3	-	588	588	3,712	502	
	Forest Service	3	-	2,050	2,050	3,075	69,480	
	Indian Service	7	1,740	339	2,079	3,714	436,234	
	Non-Fed. Public	7	484	426	910	2,814	12,931	
Region	Private	28	5,508	168	5,676	15,255	81,177	
	Total	45	7,732	2,983	10,715	24,858	599,822	
	Forest Service	42	1,088	5,196	6,284	11,417	385,910	
	Indian Service	18	4,595	354	4,949	6,940	558,978	
Non-Fed. Public	25	2,131	1,753	3,884	12,710	153,493	1,440	
	Private	187	8,455	799	9,254	27,579	203,538	1,762
Region Total		272	16,269	8,102	24,371	58,646	1,301,969	9,892

(Cont'd)

Table 2A (Cont'd) Summary of Local Control by States, North Central Region, 1943

State	Ownership Class	Number of Acres	Acres White Pine Protected		Acres Worked	Rusts Pulled	Total 0-Count Man-Days Used
			Natural	Planted			
Illinois	Non-Fed. Public	3	92	317	1,100	87,470	601
	Private	6	-	133	723	1,655	189
	Total	9	92	450	1,823	89,125	790
Indiana	Non-Fed. Public	13	-	167	1,822	36,114	112
	Private	1	4	-	14	6,987	46
	Total	14	4	167	1,836	42,101	158
Iowa	Non-Fed. Public	136	-	83	733	11,170	165
	Private	137	4	83	77	18,127	217
	Total	273	4	166	810	29,297	382
Michigan	Forest Service	25	551	1,884	6,961	153,786	883
	Non-Fed. Public	32	1,796	846	7,773	38,194	181
	Private	157	4,682	1,615	25,584	189,576	1,416
Minnesota	Forest Service	214	7,029	14,325	10,315	381,580	2,130
	Indian Service	75	7,360	2,016	14,080	560,346	3,961
	Non-Fed. Public	11	2,855	15	3,226	122,744	877
Ohio	Forest Service	8	702	-	1,022	33,226	750
	Indian Service	1	-	2	33	50	2
	Total	95	7,731	14,341	15,417	714,656	5,590
Wisconsin	Forest Service	3	-	754	4,798	13,186	239
	Indian Service	30	-	467	2,787	27,266	215
	Non-Fed. Public	33	-	1,221	7,585	140,152	1,541
Region	Forest Service	39	12,543	3,654	38,533	710,478	5,053
	Indian Service	103	7,911	5,930	24,116	783,806	5,910
	Non-Fed. Public	62	4,965	367	7,580	588,739	4,091
Region Total	Forest Service	405	13,087	2,787	55,540	1,467,703	3,586
	Indian Service	590	30,585	11,933	104,219	2,061,198	15,190
	Total	995	30,585	11,933	104,219	2,061,198	15,190

Table 3. Summary of Local Control by Ownership Classes and Agencies, North Central Region, 1943

Ownership Class	Work Agency	Number of Areas	Acres White Pine Protected		Acres Worked		Number of Ribes Pulled		Man-days Used
			Natural	Planted	Total	Worked	Pulled		
Forest Service	Bur.-Regular	7	<u>Initial Eradication</u>		559	2,070	10	5	
	F.S.-Regular	48	228	331	6,595	9,289	392,065	2,506	
	F.S.-C.P.S.	6	-	403	403	1,340	5,621	26	
	Total	61	6,823	734	7,557	12,699	397,696	2,537	
Indian Service	I.S.-Reg.& Tribal	2	370	13	383	640	29,761	404	
Non-Fed. Public	Reg.-Coop.	36	2,491	886	3,377	8,403	57,380	645	
	C.P.S.	1	-	210	210	870	10,271	188	
	Total	37	2,491	1,096	3,587	9,273	67,651	833	
Private	Reg.-Coop.	218	4,632	1,988	6,620	27,961	264,115	1,824	
All Ownerships	Reg.-Coop.	254	7,123	2,874	9,997	36,364	321,495	2,469	
	Bur.-Regular	7	228	331	559	2,070	10	5	
	F.S.-Regular	48	6,595	-	6,595	9,289	392,065	2,506	
	I.S.-Reg.& Tribal	2	370	13	383	640	29,761	404	
	C.P.S.	7	-	613	613	2,210	15,892	214	
Total Initial		318	14,316	3,831	18,147	50,573	759,223	5,598	
Forest Service	F.S.-Regular	39	<u>Re-eradication</u>		5,620	10,011	384,356	2,983	
	F.S.-C.P.S.	3	1,038	4,582	664	1,406	1,554	20	
	Total	42	1,038	5,196	6,284	11,417	385,910	3,003	
Indian Service	I.S.-Reg.& Tribal	18	4,595	354	4,949	6,940	558,978	3,687	
Non-Fed. Public	Reg.-Coop.	25	2,131	1,753	3,884	12,710	153,493	1,440	
	Reg.-Coop.	187	8,455	799	9,254	27,579	203,588	1,762	
All Ownerships	Reg.-Coop.	212	10,586	2,552	13,138	40,289	357,081	3,202	
	F.S.-Regular	39	1,038	4,582	5,620	10,011	384,356	2,983	
	I.S.-Reg.& Tribal	18	4,595	354	4,949	6,940	558,978	3,687	
	F.S.-C.P.S.	3	50	614	664	1,406	1,554	20	
Total Re-eradication		272	16,269	8,102	24,371	58,646	1,301,969	9,892	

(Cont'd)

Table 3. (Cont'd) Summary of Local Control by Ownership Classes and Agencies, North Central Region, 1943

Ownership Class	Work Agency	Number of Areas	Acres White Pine Protected		Acres Worked	Number of Ribas Pulled		Man-days Used
			Natural	Planted		Total		
Initial and Re-eradication								
Forest Service	Bur.-Regular	7	228	331	2,070	559	10	5
	F.S.-Regular	87	7,633	4,532	19,300	12,215	776,421	5,489
	F.S.-C.P.S.	9	50	1,017	2,746	1,067	7,175	66
	Total	103	7,911	5,980	24,116	13,641	783,606	5,550
Indian Service	I.S.-Reg. & Tribal	60	6,865	367	7,520	2,332	528,139	4,391
	Reg.-Coop.	61	4,622	2,639	21,113	7,261	210,673	2,065
	C.P.S.	1	-	210	870	210	10,271	128
Total		62	11,487	5,216	29,503	9,803	349,083	4,519
Private All Ownerships	Reg.-Coop.	405	13,087	8,787	55,400	25,626	167,709	3,380
	Reg.-Coop.	166	17,709	5,426	76,653	23,135	678,576	5,671
	Bur.-Regular	7	228	331	2,070	559	10	5
	F.S.-Regular	87	7,633	4,532	19,300	12,215	776,421	5,489
	I.S.-Reg. & Tribal	20	4,965	367	7,580	5,332	588,739	4,090
C.P.S.		10	50	1,227	3,616	1,227	17,446	24
Region Total		590	30,595	11,753	109,219	12,516	2,061,192	15,160

Table 4c. Results of Clostridia and Ribes Inoculations, by Station, North Central Region, 1949

State	Number of Areas	Checking after Eradication				Classification of Worked Areas on Basis of Ribes F.L.S. Left After Erad.							
		Acres Worked	Strip Acres	Ribes Found		Ribes per Acre		0.0-15.0		15.1-25.0		Over 25.0	
				Bushes	F.L.S. %	Bushes	F.L.S. %	F.L.S.	(Acres)	F.L.S.	(Acres)	F.L.S.	(Acres)
Illinois	3	1,150	22.00	121	213.7	5.5	9.7	870	280				
Michigan	214	40,318	759.10	771	2,208.0	1.0	2.9	38,687	1,211				
Minnesota	45	9,924	190.86	325	971.0	1.7	5.1	9,470	20				
Ohio	5	5,028	26.70	23	85.0	0.9	3.2	5,028	-				
Wisconsin	60	30,681	372.00	1,029	1,908.8	2.8	5.1	28,263	2,418				
Region Total	327	87,101	1,370.60	2,269	5,386.5	1.7	3.9	82,318	3,929				

Table 4-A. Results of Checking after Ribes Eradication by Ownership
Classes, North Central Region, 1943

Classification of Worked Areas on Basis of Ribes F.L.S. Left after Erad.												
Ownership Class	Number of Areas	Checking after Eradication				Classification of Worked Areas on Basis of Ribes F.L.S. Left after Erad.						
		Acres Worked	Strip Acres	Ribes Found		Ribes per Acre		0.0-15.0 F.L.S.		15.1-25.0 F.L.S.		Over 25.0 F.L.S.
				Bushes	F.L.S.	Bushes	F.L.S.	F.L.S.	F.L.S.			
										(Acres)	(Acres)	
Forest Service	54	16,679	289.61	492	1,236.7	1.7	4.3	15,849	190	640		
Indian Service	15	5,418	61.08	231	688.4	3.8	11.3	3,130	2,288			
Non-Fed. Public	61	21,477	352.07	505	1,542.6	1.4	4.4	21,013	440			
Private	197	43,527	667.90	1,041	1,918.8	1.6	2.9	42,326	1,011	100		
Region Total	327	87,101	1,370.66	2,269	5,386.5	1.7	3.9	82,318	3,929	854		

Table 5 Control Area Permits, North Central Region, 1943

State	Season 1943	Number Applications Received	Number Applications Approved	Number Applications Rejected	Percent Applications Approved	Approximate Number Man-days
Illinois	Spring	13	12	1	92.3	0.5
	Fall	4	4	0	100.0	0.5
	Total	17	16	1	94.1	1.0
Michigan	Spring	1,365	1,364	1	99.9	11.0
	Fall	523	523	0	100.0	4.0
	Total	1,888	1,887	1	99.9	15.0
Minnesota	Spring	220	215	5	97.7	15.0
	Fall	47	46	1	97.9	7.0
	Total	267	261	6	97.8	22.0
Ohio	Spring	2,268	2,257	11	99.5	40.0
	Fall	888	884	4	99.5	20.0
	Total	3,156	3,141	15	99.5	60.0
Wisconsin	Spring	1,252	1,236	16	98.7	14.0
	Fall	166	165	1	99.4	2.0
	Total	1,418	1,401	17	98.8	16.0
Region	Spring	5,118	5,084	34	99.3	80.5
	Fall	1,628	1,622	6	99.6	33.5
	Total	6,746	6,706	40	99.4	114.0

Table 6 and 7. (Cont'd) Status of Control by State and Ownership Classes, North Central Region, Dec. 31, 1963

Ownership Class	Total Control Problem, Net Acres				Net Acres Initially Worked				Net Acres		Net Acres as Maintained	
	Total				Total				Initially Worked			
	Planted				Planted				Control			
	White Pine	White Pine	White Pine	Control Area	White Pine	White Pine	White Pine	Control Area	White Pine	Control Area	White Pine	Control Area
U.S.F.S.	132,241	11,136	113,377	201,566	35,501	9,116	44,617	75,944	63,750	125,625	12,223	22,364
U.S.F.S.	19,232	537	19,539	30,163	18,192	253	18,445	26,247	1,094	1,422	4,734	7,603
Non-Fed. Pub.	45,660	15,378	61,038	130,921	28,925	6,064	34,989	72,466	26,056	59,655	8,219	17,667
Private	98,407	432	98,839	277,640	67,134	437	67,571	207,416	21,275	76,224	16,457	34,604
Total	295,540	17,483	313,023	530,290	121,753	15,716	137,469	282,073	112,215	241,926	30,917	54,538
U.S.F.S.	-	505	505	3,746	-	199	199	1,798	304	1,940	117	1,090
Non-Fed. Pub.	31	15,377	15,348	95,275	29	3,610	3,639	33,140	11,729	60,715	452	6,280
Private	3,205	16,637	19,842	351,201	3,023	7,578	10,606	150,042	9,236	201,139	2,139	48,714
Total	3,236	16,912	19,847	354,222	3,052	11,387	14,444	186,980	11,268	262,794	2,608	55,884
U.S.F.S.	17,001	11,567	28,568	71,465	15,714	11,035	26,749	63,466	1,813	8,019	2,037	4,810
U.S.F.S.	29,705	775	30,679	66,572	23,208	775	23,983	48,443	6,695	18,129	138	3,300
Non-Fed. Pub.	50,775	16,263	67,038	183,264	45,603	15,434	61,037	161,273	6,001	21,991	10,049	25,614
Private	241,345	8,930	250,275	1,064,127	139,944	5,664	145,608	667,268	20,766	396,879	25,736	64,818
Total	338,826	27,535	366,361	1,365,386	294,469	12,308	307,777	1,334,450	24,675	424,918	37,960	95,530
U.S.F.S.	138,239	55,605	193,844	418,532	69,705	51,691	118,699	259,324	75,445	110,608	37,448	8,130
U.S.F.S.	49,105	1,157	50,262	97,241	41,400	1,038	42,438	76,696	7,324	20,315	1,902	8,370
Non-Fed. Pub.	244,621	97,353	341,974	776,371	171,716	63,030	234,806	593,921	57,176	177,450	25,116	38,114
Private	259,011	68,215	327,226	2,724,647	147,512	50,124	197,636	1,333,926	107,830	906,281	64,584	27,719
Total	691,976	216,330	908,306	3,016,791	330,333	116,883	453,179	2,048,871	240,775	1,314,654	128,050	78,333

Includes an investigation of small acreage of land under Federal control in connection with Governmental business.

TABLE 8. Summary of Logs Destroyed by States, from Inception to December 31, 1943
North Central Region

State	Period of Fire	Gross Acres White Pine Protected	Gross Acres Worked	Number of Ribs Pulled	Total 5-Hour Man-days	Average per Acres Worked		Average Ribs Pulled Per Man-day
						Man-days	Ribs	
Initial Predication								
Illinois	1932-1943	3,323	15,076	1,654,92	4,674	0.29	104	354
Indiana	1933-1943	5,979	74,444	402,341	3,766	0.05	5	107
Iowa	1933-1943	3,039	35,735	3,218,671	24,350	0.68	90	132
Michigan	1928-1943	409,973	1,236,712	84,185,400	272,538	0.22	52	236
Minnesota	1917-1943	165,299	407,112	59,900,526	149,058	0.37	145	393
Ohio	1933-1943	14,453	192,169	2,512,625	32,471	0.17	13	77
Wisconsin	1920-1943	287,908	1,001,650	81,494,024	345,846	0.35	84	264
Region Total Initial Predication		849,974	2,903,868	213,461,113	333,948	0.29	53	138
Re-eradication								
Illinois	1936-1943	1,053	11,026	771,938	3,435	0.31	70	225
Indiana	1936-1943	2,300	10,886	74,479	1,053	0.10	7	70
Iowa	1936-1943	501	3,485	246,132	2,161	0.62	71	134
Michigan	1932-1943	103,326	286,504	7,176,961	45,253	0.16	25	199
Minnesota	1933-1943	55,589	112,466	7,099,235	35,693	0.32	63	199
Ohio	1936-1943	5,362	37,508	820,005	10,187	0.27	32	80
Wisconsin	1934-1943	63,612	261,170	6,494,718	60,216	0.16	25	134
Region Total Re-eradication		271,823	723,285	22,671,510	116,915	0.20	31	132
Initial and Re-eradication								
Illinois	1932-1943	4,376	26,902	2,425,620	8,109	0.30	90	299
Indiana	1933-1943	8,279	85,300	1,76,820	4,829	0.06	6	59
Iowa	1933-1943	3,620	39,220	3,464,803	26,511	0.68	88	134
Michigan	1928-1943	513,299	1,523,216	71,382,361	317,796	0.21	47	229
Minnesota	1917-1943	220,888	519,570	65,979,613	185,591	0.36	127	356
Ohio	1933-1943	19,815	229,757	3,332,630	42,658	0.19	15	78
Wisconsin	1920-1943	371,520	1,262,780	90,978,772	394,062	0.31	72	241
Region All Eradication		1,444,707	3,686,753	238,661,673	979,586	0.27	65	243

Table 9. Summary of Nursery Auditation, North Central Region, 1963

Ownership Class	Work Agency	Number of Nurseries	White Pine Trees in Nurseries	Acres Planted	Acres Worked	Lower Fiber Destroyed			Matured or Dead
						U.S.C.	Cult.	Wild	
<u>Illinois</u>									
State Private	Reg.-Coop.	1	350,000	90	575	-	1	90	7
		5	17,000	55	1,360	95	183	570	60
Total		6	367,000	145	1,935	95	184	660	67
<u>Indiana</u>									
State	Reg.-Coop.	2	2,000,000	20	20	-	-	-	-
State Private	Reg.-Coop.	2	600,000	110	450	-	-	3,005	32
		5	35,000	150	1,706	2	240	12,063	24
Total		7	2,600,000	260	2,156	-	240	15,068	56
<u>Michigan</u>									
Forest Service S.O.B.	F.S.-Regular S.O.B.	1	5,500,000	60	570	-	-	650	15
		1	1,100,000	7	430	-	-	3,079	20
State Private	Reg.-Coop.	3	6,607,700	55	1,113	-	-	952	38
		3	300,000	10	300	-	-	-	1
Total		6	13,507,700	122	2,413	-	-	2,681	74
<u>Minnesota</u>									
Forest Service State	Reg.-Coop.	1	215,000	60	456	-	-	50	2
		1	1,500,000	335	1,037	-	-	77	1
Total		2	1,715,000	395	1,493	-	-	127	3

(Continued)

Table 9. (Cont'd) Summary of Nursery Sanitation, North Central Region, 1943

Ownership Class	Work Agency	Number of Nurseries	White Pine Trees in Nurseries	Areas Protected	Areas Marked	Number Voles Destroyed			Man-Days Used
						C.B.U.	Other	Wild	
<u>Ohio</u>									
State	Reg.-Coop.	1	2,500,000	57	530	-	-	-	1
Private	Reg.-Coop.	2	27,000	60	658	-	-	20	2
Total		3	2,527,000	117	1,188	0	0	20	3
<u>Wisconsin</u>									
State	Reg.-Coop.	1	937,000	20	373	-	-	904	30
County	Reg.-Coop.	1	300,000	8	200	-	-	47	1
Total		2	1,237,000	28	573	0	0	951	31
<u>Region</u>									
Forest Service	F.S.A. Bur.-Sug.	2	5,715,000	120	1,026	-	-	650	17
S.O.S.	S.O.S.	1	1,102,000	7	430	-	-	3,079	22
State	Reg.-Coop.	10	11,554,700	720	4,336	-	1	5,821	165
County	Reg.-Coop.	1	300,000	8	200	-	-	47	1
Private	Reg.-Coop.	13	379,000	276	4,024	92	431	11,731	99
Region Total		27	18,950,700	1,121	20,016	92	432	21,328	304

1 - Time charged to General Supervision

Table 10. Cultivated Black Currant Elimination, North Central Region, 1943

State	Number of Counties Worked	Total Number Inspections	Found		Destroyed		Number of Days Used
			Locations	Bushes	Locations	Bushes	
Indiana	8	1,202	<u>Initial</u>				
Iowa	9	6	1	18	3	16	1
<u>Total</u>	<u>17</u>	<u>1,207</u>	<u>2</u>	<u>21</u>	<u>12</u>	<u>36</u>	<u>12</u>
Iowa	5	25	<u>Recheck</u>				
Ohio	41	116	13	25	7	10	6
<u>Total</u>	<u>17</u>	<u>141</u>	<u>13</u>	<u>53</u>	<u>52</u>	<u>220</u>	<u>16</u>
Indiana	8	1,202	<u>Initial and Recheck</u>				
Iowa	15	50	1	3	3	15	1
Ohio	41	116	14	45	16	51	15
<u>Total</u>	<u>64</u>	<u>1,368</u>	<u>5</u>	<u>53</u>	<u>52</u>	<u>220</u>	<u>16</u>
			<u>20</u>	<u>77</u>	<u>71</u>	<u>86</u>	<u>32</u>

Note: O.B.C. elimination in Indiana and Ohio performed in connection with scouting for the rust, and in Iowa chiefly as part of local control and post-check.

Table 11. Cumulative Cultivated Black Currant Elimination,
North Central Region, to December 31, 1943

State	Total Number of Inspections	Found		Destroyed		Number Locations per 1,000 Inspections
		Locations	Bushes	Locations	Bushes	
Illinois	48,067	532	4,171	60	564	11.1
Indiana	64,226	5	20	3	15	0.2
Iowa	317,976	1,588	7,207	1,527	6,942	5.0
Michigan	980,633	14,926	144,354	14,859	143,700	15.2
Minnesota	211,664	3,260	23,506	3,260	23,306	15.4
Ohio	1,845,970	8,838	75,605	8,406	73,117	4.8
Wisconsin	922,898	6,601	37,080	6,597	37,051	7.2
Region Total	2,391,454	35,750	291,765	41,712	264,695	9.1

Table 12. Total North Central Region Expenditures, Including Milwaukee Office,
Classified According to State and Activity - 1943

Activity	Illinois	Indiana	Iowa	Michigan	Minnesota	Ohio	Wisconsin	Total	Percent Activity
Supervision	\$2,782.39	\$817.85	\$5,116.27	\$20,362.44	\$22,104.82	\$10,422.31	\$24,478.17	\$86,094.25	44.1
Ribes Eradication	6,264.57	803.03	3,045.76	16,514.83	39,790.39	5,218.67	32,290.31	103,927.61	49.6
Cultivated Black									
Current Elimination		7.50	222.88	=	=	110.00	20.04	360.42	0.2
Nursery Sanitation	401.38	=	1,720.72	492.15	350.00	=	336.12	3,300.35	1.6
Value of Cultivated									
Ribes Destroyed	=	=	100.70	2.30	=	=	174.75	277.75	0.1
Canker Elimination	=	=	=	=	214.57	66.00	=	280.57	0.1
Surveys	1,410.08	=	=	1,451.96	27.76	732.46	53.02	3,675.28	1.8
Checking and Other									
Field Data	96.93	14.66	170.70	2,636.25	1,519.99	684.91	6,430.55	11,554.02	5.5
Region Total	\$10,955.40	\$1,613.04	\$10,377.03	\$41,459.94	\$64,007.53	\$17,231.55	\$53,782.76	\$209,160.25	100.0
Percent of Total	5.2	0.8	4.9	19.9	30.6	8.2	30.4	100.0	

Table 12a. Summary of Expenditures by Agencies and Activities, North Central Section, 1943.

Appropriation or Agency	Expendi- ture Classi- fication	General Super- vision	Local Control	C.B.C. Elimi- nation	Nursery Sani- tation	Value of		Canker Pruning	Survey	Other Field Data	Totals
						Cultivated Ribes Destroyed					
State & Private January-June	Salary	\$6,035.34	\$7,568.23	-	\$517.47	-	-	-	\$1,177.00	\$1,800.00	\$17,098.04
	Non-Sal.	3,959.93	1,540.36	-	164.86	\$151.50	-	-	598.19	1,120.00	7,534.84
	Total	9,995.27	9,108.59	-	682.33	151.50	-	-	1,775.19	2,920.00	24,632.88
State & Private July-December	Salary	4,475.14	8,118.72	-	525.92	-	-	-	209.85	1,903.50	15,255.03
	Non-Sal.	4,172.91	2,666.53	\$117.50	132.20	126.25	-	-	159.75	1,116.00	8,191.14
	Total	8,648.05	10,785.25	117.50	658.12	126.25	-	-	369.60	3,019.50	23,446.17
Bureau-Reg. (3101) January-June	Salary	30,493.58	509.92	43.90	806.00	-	-	-	548.60	2,034.38	34,441.94
	Non-Sal.	3,065.13	406.65	20.04	140.37	-	-	\$2.64	163.54	187.51	3,985.88
	Total	33,558.71	916.57	63.94	946.37	-	-	2.64	712.14	2,221.89	38,427.82
Bureau-Reg. (3101) July-December	Salary	28,409.65	704.50	131.80	527.20	-	-	-	725.03	1,552.15	32,050.33
	Non-Sal.	2,784.34	169.69	47.18	172.15	-	-	-	2.43	169.75	3,345.31
	Total	31,193.99	874.19	178.98	699.35	-	-	-	727.46	1,721.90	35,395.64
Bur.-Coop (3103) January-June	Salary	-	10,235.28	-	120.04	-	-	66.00	-	-	10,421.32
	Non-Sal.	-	347.79	-	76.26	-	-	-	-	-	424.05
	Total	-	10,583.07	-	196.30	-	-	66.00	-	-	10,845.37
Bur.-Coop (3103) July-December	Salary	-	12,736.59	-	-	-	-	-	-	-	12,736.59
	Non-Sal.	-	1,524.13	-	-	-	-	-	38.63	87.01	1,610.77
	Total	-	14,260.72	-	-	-	-	-	38.63	87.01	14,346.36
Forest Serv. Reg. January-June	Salary	1,246.44	16,886.90	-	55.00	-	-	-	-	126.00	18,514.34
	Non-Sal.	.60	1,625.01	-	-	-	-	-	-	52.65	1,678.26
	Total	1,247.04	18,511.91	-	55.00	-	-	-	-	178.65	19,992.60
Forest Serv. Reg. July-December	Salary	933.94	19,315.67	-	-	-	-	-	18.00	962.99	21,230.60
	Non-Sal.	-	942.00	-	-	-	-	-	6.50	371.27	1,319.77
	Total	933.94	20,257.67	-	-	-	-	-	24.50	1,334.26	22,550.57
Indian Serv. Reg. January-June	Salary	-	4,525.46	-	-	-	-	-	-	-	4,525.46
	Non-Sal.	-	74.43	-	-	-	-	-	-	-	74.43
	Total	-	4,599.89	-	-	-	-	-	-	-	4,600.39

(Continued)

Table 12a (Cont'd). Summary of Expenditures by Agencies and Activities, North Central Region, 1963.

Appropriation or Agency	Expendi- ture Classification	General Super- vision	Local Control	C.B.C. Elimi- nation	Nursery Semi- station	Value of		Canker Pruning Surveys	Other Fuels Data	Totals
						Cultivated Rivers Destroyed				
Landis Ferry Dam, July-December	Salary	-	\$9,128.76	-	-	-	-	\$27.76	-	\$9,156.52
	Non-Sal.	-	322.73	-	-	-	-	-	-	322.73
	Total	-	9,451.51	-	-	-	-	27.76	-	9,479.27
D.P.S. (F.B.C.) January-June	Salary	-	30.00	-	-	-	-	-	-	30.00
	Non-Sal.	-	-	-	-	-	-	-	-	-
	Total	-	30.00	-	-	-	-	-	-	30.00
D.P.S. (F.B.C.) July-December	Salary	-	24.75	-	-	-	-	-	-	24.75
	Non-Sal.	-	-	-	-	-	-	-	-	-
	Total	-	24.75	-	-	-	-	-	-	24.75
I.S. Tribal January-June	Salary	-	2,549.90	-	-	-	-	-	-	2,549.90
	Non-Sal.	-	70.33	-	-	-	-	-	-	70.33
	Total	-	2,620.23	-	-	-	-	-	-	2,690.23
I.S. Tribal July-December	Salary	-	2,738.32	-	-	-	-	-	-	2,738.32
	Non-Sal.	-	164.94	-	-	-	-	-	-	181.41
	Total	-	2,903.26	-	-	-	-	-	-	2,983.65
D.O.B. Regular January-June	Salary	-	-	-	\$62.88	-	-	-	-	62.88
	Non-Sal.	-	-	-	-	-	-	-	-	-
	Total	-	-	-	62.88	-	-	-	-	62.88
State W.P.A. January-June	Salary	\$473.46	-	-	-	-	-	\$208.00	\$70.81	752.27
	Non-Sal.	28.49	-	-	-	-	-	3.93	-	32.42
	Total	501.95	-	-	-	-	-	211.93	70.81	764.69

(Cont'd.)

Table 12a (Cont'd). Summary of Expenditures by Agencies and Activities, North Central Region, 1943.

Appropriation or Agency	Expendi- ture Classi- fication	General Super- vision	Local Control	C.B.C. Elimi- nation	Nursery Sani- tation	Value of				Totals
						Cultivated Ribes Destroyed	Canker Pruning	Surveys	Other Field Data	
Total January-June	Salary	\$38,253.82	\$42,305.69	\$43.90	\$1,561.39	-	\$274.00	\$1,725.60	\$4,031.19	\$88,195.99
	Non-Sal.	7,054.15	4,064.57	20.04	381.49	\$151.50	6.57	761.73	1,360.16	13,600.21
	Total	45,307.97	46,370.26	63.94	1,942.88	151.50	280.57	2,487.33	5,391.35	101,996.20
Total July-December	Salary	33,819.03	51,767.33	131.80	1,053.12	-	-	980.64	4,418.64	92,170.56
	Non-Sal.	6,957.25	5,790.02	164.68	304.35	126.25	-	207.31	1,744.03	15,293.89
	Total	40,776.28	57,557.35	296.48	1,357.47	126.25	-	1,187.95	6,162.67	107,464.45
Total	Salary	72,072.85	94,073.02	175.70	2,614.51	-	274.00	2,706.24	8,449.83	180,366.15
	Non-Sal.	14,011.40	9,854.59	184.72	685.84	277.75	6.57	969.04	3,104.19	29,094.10
	Total	86,084.25	103,927.61	360.42	3,300.35	277.75	280.57	3,675.28	11,554.02	209,460.25

a - Includes \$790.56 of denominational contributions toward C.P.S. program in Ohio.

Table 13. Approximate Number of Persons Employed by Months and Agencies,
South Central Region, 1945.

Work Agency	Number of People by Months												Average per Month	
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Total
Illinois														
State & Private	3.0	2.0	2.0	2.0	2.0	4.0	2.0	1.0	1.0	1.0	1.0	2.0	23.0	1.9
Bur. 5108	-	-	-	6.0	6.0	4.6	-	-	2.0	2.0	1.0	1.0	23.6	2.0
Total	3.0	2.0	2.0	8.0	8.0	8.6	2.0	1.0	3.0	3.0	2.0	3.0	46.6	3.9
Indiana														
State & Private	0.2	0.2	0.2	0.2	1.2	1.2	0.2	0.2	0.2	0.2	0.2	0.2	4.4	0.4
Bur. 5103	-	-	-	-	2.1	2.0	-	-	-	-	-	-	4.1	0.3
Total	0.2	0.2	0.2	0.2	3.3	3.2	0.2	0.2	0.2	0.2	0.2	0.2	8.5	0.7
Iowa														
State & Private	-	-	-	1.0	3.0	3.0	1.0	1.0	1.0	2.0	-	-	13.0	1.1
Bur. 5101	2.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	18.0	1.6
Bur. 5105	-	-	-	-	-	-	1.0	2.0	2.0	2.0	1.0	1.0	10.0	0.8
Total	2.0	2.0	2.0	2.0	4.0	5.0	3.0	4.0	4.0	5.0	3.0	3.0	41.0	3.4
Michigan														
State & Private	4.2	3.5	3.1	1.6	2.6	1.0	15.6	6.8	3.8	3.8	0.8	0.8	46.9	3.9
Bur. 5101	2.3	3.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	38.3	2.9
Bur. 5103	-	-	-	-	8.6	18.9	3.0	15.6	6.8	1.1	-	-	48.7	4.1
P.B. Regular	-	-	-	-	1.8	25.1	-	6.7	8.1	-	-	-	41.7	3.5
C.P.S. & Wlad.	1.3	-	-	0.8	-	1.0	-	0.7	-	-	-	-	3.8	0.3
Total	7.8	6.3	6.1	5.4	16.9	40.0	21.6	32.8	21.5	7.9	3.8	3.8	176.4	14.7
Minnesota														
State & Private	1.0	1.5	2.0	2.0	2.0	0.5	8.7	5.5	1.5	1.5	2.0	2.0	34.2	2.8
Bur. 5101	3.0	4.0	4.0	3.5	5.0	4.0	3.5	3.0	3.0	2.5	3.0	3.0	38.0	3.2

Table 13. (Cont'd) Approximate Number of Persons Employed by Months and Agencies,
North Central Region, 1945.

Work Agency	Number of People by Months												Average per Month	
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Total
Minnesota (Cont'd)														
Bur. 3103	-	-	-	-	-	4.0	9.0	7.0	-	-	-	-	20.0	1.1
F.S. Reg.	-	-	-	-	6.5	80.0	75.0	72.0	10.0	-	-	-	243.5	20.3
I.S. Reg.	-	-	-	-	-	8.0	-	30.0	1.5	-	-	-	39.5	3.3
State W.P.A.	4.4	-	-	-	-	-	-	-	-	-	-	-	4.4	0.4
Total	6.4	5.5	6.0	5.5	11.5	101.5	96.2	117.5	16.0	4.0	3.0	5.0	350.1	31.7
Ohio														
State & Private	0.3	0.3	0.8	0.8	1.8	17.6	1.0	0.2	0.8	0.8	0.8	0.8	26.0	2.2
Bur. 3101	2.0	2.0	2.0	2.0	1.0	1.5	2.3	2.0	2.5	2.5	2.6	2.5	24.9	2.1
Bur. 3103	-	-	0.3	0.2	2.2	9.7	0.7	1.9	-	-	-	-	15.0	1.3
Total	2.3	2.3	3.1	3.0	5.0	28.8	4.0	4.1	3.3	3.3	3.4	3.3	65.9	5.5
Wisconsin														
State & Private	4.0	4.0	4.0	4.0	7.0	12.0	9.0	10.0	5.0	4.0	4.0	5.0	72.0	6.0
Bur. 3101	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	48.0	4.0
Bur. 3103	-	-	-	-	4.0	18.0	9.0	19.0	10.0	1.0	1.0	-	62.0	5.2
F.S. Reg.	-	-	-	-	9.0	20.0	-	2.0	4.0	-	-	-	35.0	2.9
I.S. Reg. & Tribal	-	-	-	1.0	22.0	2.0	19.0	14.0	-	-	-	-	58.0	4.6
Total	8.0	8.0	8.0	9.0	45.0	56.0	41.0	49.0	25.0	9.0	9.0	9.0	275.0	22.9
Milwaukee														
Bur. 3101	8.0	8.0	8.0	8.0	8.0	9.0	8.0	7.0	7.0	7.0	7.0	7.0	92.0	7.7
F.S. Reg.	1.0	1.0	1.0	1.0	-	-	-	-	-	1.0	1.0	1.0	7.0	0.6
Total	9.0	9.0	9.0	9.0	8.0	9.0	8.0	7.0	7.0	8.0	8.0	8.0	99.0	8.3

(Cont'd)

Table 14. Current and Cumulative Summary of Timber Planting,
North Central Region, to December 31, 1943.

State	Period of Time	Number Areas Treated	Number Trees Planted	Number Trees Treated	Number Trees Removed	Number Cankers Removed	Number Man-days Used
Michigan	1933-1942 1943	220	705,046	38,117	221	94,327	3,085
Minnesota	1933-1943	236	703,015	35,177	234	141,327	5,063
	1933-1942	142	222,862	10,744	1,171	27,739	1,011
	1943	1	2,600	408	28	2,260	40
Ohio	1933-1943	113	225,752	11,132	1,112	22,039	1,031
	1941-1942	3	300	13	7	16	-
	1943	1	1,005	30	6	108	16
Region Total	1933-1943	669	2,033,813	113,126	4,520	261,441	10,199
Region	1933-1942	442	925,921	46,874	1,409	132,071	4,076
	1943	2	5,845	438	34	3,368	35

OMNIBUS TABLE #1 SUMMIT #1
SUMMARY OF 1943 RIBES ERADICATION

State	Initial eradication work			Reeradication work			Totals		
	Average Worked	Number and Cultivated Ribes Destroyed	Number 8-Hour Man-days	Average Worked	Number and Cultivated Ribes Destroyed	Number 8-Hour Man-days	Average Worked	Number Wild & Cult. only	Number 8-Hour Man-days
Illinois	723	46,565	199	1,400	87,470	601	2,123	134,035	790
Indiana	1,522	28,111	112	-	-	-	1,522	28,111	112
Iowa	264	13,554	109	515	4,883	108	777	18,437	211
Michigan	21,258	98,312	630	19,060	282,238	1,650	40,318	381,550	2,480
Minnesota	9,258	389,772	2,644	9,103	327,054	2,946	18,561	716,826	5,590
Ohio	3,073	39,950	443	3,712	502	11	7,585	40,452	454
Wisconsin	13,675	141,656	1,277	24,858	599,822	4,576	38,533	742,478	5,853
Total	50,573	759,822	5,595	58,645	1,301,969	9,892	109,219	2,061,192	15,490

*Number 8-hour man-days equals $\frac{\text{hours worked per day} \times \text{number men}}{8}$

OMNIBUS TABLE #1 SHEET #2

SUMMARY OF 1943 RIBES ERADICATION

State	Ribes per Acre		Man-days per Acre		Number of Employees*						
	Eradi- cation	Reeradi- cation	Eradi- cation	Reeradi- cation	Number of Camps			Laborers			Super- vision
					S.C.S.	C.P.S.	Reg.	S.C.S.	C.P.S.	Reg.	
	Initial		Initial		Total	Total	Total	Total	Total	Total	Total
Illinois	64.4	62.5	0.26	0.43	-	-	-	17	17	3	20
Indiana	18.7	-	0.07	-	-	-	-	10	10	1	11
Iowa	51.3	9.5	0.39	0.21	-	-	-	4	4	1	5
Michigan	4.7	14.8	0.04	0.09	-	1	1	3	64	70	6
Minnesota	42.1	35.9	0.29	0.32	-	4	4	-	117	117	10
Ohio	10.3	0.1	0.11	trace	1	-	1	22	35	57	2
Wisconsin	10.4	24.1	0.09	0.18	-	-	-	22a	75	110	6
Total	15.0	22.2	0.11	0.17	1	5	6	25	38	322	29
											414

*Enter the maximum number of persons on the pay roll at the peak of the season. Total number persons employed is not desired because the large turnover in C.P.S. camps would result in an exaggerated figure.

a - Indian Tribal funds

b - Private and State cooperation.

OMOTIBUS TABLE #2 SHEET #1

SUMMARY OF 1943 RIBES ERADICATION - BY PROGRAMS
(Including all work in initial and reeradication)

State	Regular and Cooperative			C.P.S.			S.C.S.		
	Acreage Worked	Number Wild and Cultivated Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Number Wild and Cultivated Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Number Wild and Cultivated Ribes Destroyed	Number 8-Hour Man-days
Illinois	2,123	134,035	790	-	-	-	-	-	-
Indiana	1,522	28,414	112	-	-	-	-	-	-
Iowa	777	18,437	211	-	-	-	-	-	-
Michigan	37,572	374,375	2,434	2,716	7,175	46	-	-	-
Minnesota	18,361	716,826	5,590	-	-	-	-	-	-
Ohio	6,715	30,181	266	670	10,271	183	-	-	-
Wisconsin	38,533	741,478	5,853	-	-	-	-	-	-
Total	105,603	2,043,746	15,256	3,616	17,146	234	-	-	-

*This includes work of Bureau, cooperating State and private agencies, Forest Service and Interior Department work with regular funds. This table recapitulates the totals on Table 1 Sheet 1.

a. - Includes 12 man-days Regular and 34 man-days C.P.S.

OMNIBUS TABLE #3 SHEET #1

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP - 1943

LAND OWNERSHIP	Initial Eradication				Reeradication				Totals			
	Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days		Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days		Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days	
National Forests	12,699	397,696	2,537		11,417	385,910	3,003		24,116	783,606	5,540	
O & C Revested lands												
Other public domain												
National Parks												
Indian Reservations	640	29,761	404		6,940	558,978	3,687		7,580	588,739	4,091	
Subtotal Federal	13,339	427,457	2,941		18,357	944,888	6,690		31,696	1,372,345	9,631	
State and private	37,234	331,766	2,657		40,289	357,081	3,202		77,523	688,847	5,859	
Total	50,573	759,223	5,598		58,646	1,301,969	9,892		109,219	2,061,192	15,490	

*Wild and cultivated Ribes.

OMNIBUS TABLE #3 SHEET #2

SUMMARY OF RIBES ERADICATION ON NATIONAL PARKS - 1943

Omitted because no work done on National Parks, North Central Region, in 1943

OMNIBUS TABLE #3 SHEET # 3

SUMMARY OF RIBES ERADICATION ON INDIAN RESERVATIONS - 1943

INDIAN RESERVATIONS (List separately)	Initial Work				Reeradication Work				Totals			
	Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days		Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days		Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days	
Nett Lake	"	"	"		3,040	93,885	642		3,040	93,885	642	
Vermilion	"	"	"		186	28,859	235		186	28,859	235	
Bad River	40	22,291	109		430	293,384	1,030		470	315,675	1,139	
Lac Court Oreillos	"	"	"		776	2,626	177		776	2,626	177	
Menominee	600	7,470	295		2,508	140,224	1,603		3,108	147,694	1,898	
Total	640	29,761	404		6,940	559,978	5,667		7,580	588,739	4,091	

*Wild and cultivated Ribes.

OMNIBUS TABLE # 3 SHEET #4

SUMMARY OF RIBES ERADICATION ON STATE & PRIVATE LANDS - 1943

State and Private Lands (List by States)	Initial Work			Reeradication Work			Totals		
	Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Number* Ribes Destroyed	Number 8-Hour Man-days
Illinois	723	46,565	189	1,400	87,470	601	2,123	134,035	790
Indiana	1,522	28,414	112	-	-	-	1,522	28,414	112
Iowa	264	13,554	103	513	4,883	108	777	18,437	211
Michigan	17,583	86,293	672	15,774	141,477	925	33,357	227,770	1,597
Minnesota	234	5,095	265	821	28,641	487	1,055	33,736	752
Ohio	3,873	39,950	443	3,712	502	11	7,585	40,452	454
Wisconsin	13,035	111,895	873	18,069	94,108	1,070	31,104	206,003	1,943
Total	37,234	331,766	2,657	40,289	357,081	3,202	77,523	688,847	5,859

*Wild and cultivated Ribes

SUMMARY TABLE #5 SHEET #5

SUMMARY OF RIBES READIICATION ON NATIONAL FOREST - 1943

NATIONAL FORESTS (List by Forests or Regions)	Initial Work				Reeducation Work				Totals			
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-days	Number Ribes Destroyed	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-days	Number Ribes Destroyed	Number 8-Hour Man-days
Elmendorf	265	7,398	127	8,815	580	8,815	159	615	16,203	286		
Denali				130,392	1,300	130,392	546	1,300	130,392	546		
Denali	400		1					400		1		
Denali	3,010	5,631	30	1,554	1,406	1,554	20	4,416	7,185	50		
Chippewa	5,405		a	1,229			a	6,634		a		
Superior	3,619	384,677	2,379	175,669	3,827	175,669	1,582	7,446	560,346	3,961		
Noddy				69,480	3,075	69,480	696	3,075	69,480	696		
Total	12,699	397,695	2,557	355,910	11,117	355,910	3,003	24,116	703,606	5,510		

Wild and cultivated Ribes
 a - Man-days charged to Resurvey and Post-check.

OMNIBUS TABLE #4 SHEET #1

SUMMARY OF ALL OTHER CONTROL WORK FOR 1943

State	Cultivated Black Currant Eradication					Nursery Sanitation			Mapping Control Areas		
	Number Inspections Made	Number Locations Found	No. Black Currants Destroyed	Number 8-Hour Man-days	Number Nurseries Worked	No. White Pines in Nurseries	No. Wild and Cultivated Ribes Destroyed	Number 8-Hour Man-days	Number Acres Mapped (W.P. & P. Zones)	Number 8-Hour Man-days	
Illinois	-	-	-	-	6	367,000	1,935	1,006	37	6,140	46
Indiana	1,202	1	15	3	1	1,000,000	208	-	a	8,106	10
Iowa	30	14	51	15	7	635,000	2,156	15,114	98	-	-
Michigan	-	-	-	-	6	11,509,700	2,413	4,664	76	31,615	141
Minnesota	-	-	-	-	2	1,715,000	1,493	107	3	427	4
Ohio	116	5	220	15a	3	2,527,000	1,238	20	3	39,090	20
Wisconsin	-	-	-	-	2	1,297,000	573	951	87	17,430	28
Total	1,342	20	286	33	27	19,050,700	10,016	21,862	304	102,808	249

a = Time charged to supervision

OMNIBUS TABLE #1, SHEET #2

SUMMARY OF ALL OTHER CONTROL WORK FOR 1945

Treatment of Infected White Pines										Checking			
State	Total Number Pines Examined	Number Infected Pines Cut Down	No. Infected Pines From Which Cank- ers Removed	Number Cankers Removed Branch Stem	Number 8-Hour Man-days	Advance		Post		Regular	Number 8-Hour Man-days		
						Acreage Checked	8-Hour Man-days	Acreage Checked	8-Hour Man-days				
Illinois										1,150	3		
Indiana													
Iowa													
Michigan								63,561	130	40,318	146		
Minnesota	2,600	23	408	2,260	40	13,144	36	11,818	30	9,924	40		
Ohio	1,005	6	30	103	15					5,028	24		
Wisconsin								42,163	81	30,681	42		
Total	3,605	34	438	2,363	55	13,144	36	117,542	241	87,101	153		

a - Exclusive of man days reported under ribes eradication.

OMNIBUS TABLE #5 SHEET #1

SUMMARY OF EXPENDITURES FOR 1943 INCLUDING MILWAUKEE OFFICE COSTS PRORATED TO STATES

State	Recapitulation of Federal Funds									
	Total		Regular Funds					Emergency Funds		
	Federal (All agencies)	State (Including all Coop. Funds)	Grand Total	Bureau Entomology & Plant Quarantine Leadership & Coord. (3101)	Lea Act (3103)	Forest Service	Dept. of Interior Indian Lands	Total Regular Funds	C.P.S. W.P.A.	Total Emergency Funds
Illinois	\$4,580.50	\$6,374.90	\$10,955.40	\$1,287.31	\$3,293.19	-	-	\$4,580.50	-	-
Indiana	684.54	958.50	1,643.04	172.51	512.03	-	-	684.54	-	-
Iowa	8,067.88	2,309.15	10,377.03	6,623.07	1,444.81	-	-	8,067.88	-	-
Michigan	32,321.05	9,138.89	41,459.94	18,641.28	7,267.55	\$6,005.63	-	31,914.46	\$54.75	\$351.84a
Minnesota	55,469.26	8,538.27	64,007.53	16,689.89	2,047.00	32,214.67	\$4,021.97	54,973.53	-	495.73
Ohio	11,586.42	5,647.93	17,234.35	9,032.42	2,554.00	-	-	11,586.42	-	-
Wisconsin	48,393.15	15,389.81	63,782.96	21,376.65	8,113.15	4,322.67	14,580.68	48,393.15	-	-
Total	161,102.80	48,357.45	209,460.25	73,523.13	25,231.73	42,542.97	18,502.65	160,200.48	54.75	847.57
										902.32

a - Includes \$62.88 Soil Conservation funds.

OMNIBUS TABLE #5 SHEET #2

SUMMARY OF EXPENDITURES FOR 1943 INCLUDING MILWAUKEE OFFICE COSTS PRORATED TO STATES

State	Financial Projects									
	BLR-1 - Leadership, Coordination and Technical Direction					BLR-3 - Cooperative Blister Rust Control on State and Privately-owned Lands				
	Indirect		Federal			Direct Aid		Federal		
	Aid State*		Regular	Emergency	Total	State*		Regular	Emergency	Total
Illinois	\$1,592.06	\$1,287.31	-	-	\$2,879.37	\$4,782.84		\$3,293.19	-	\$8,076.03
Indiana	660.00	172.51	-	-	832.51	298.50		512.03	-	810.53
Iowa	607.50	6,623.07	-	-	7,230.57	1,701.65		1,444.81	-	3,146.46
Michigan	5,334.46	17,394.90	\$288.96		23,018.32	3,804.43		8,513.93	\$117.63	12,435.99
Minnesota	5,644.77	16,426.32	283.80		22,354.89	2,893.50		2,310.57	211.93	5,416.00
Ohio	3,085.04	8,762.37	-	-	11,847.41	2,562.89a		2,824.05	-	5,386.94
Wisconsin	9,176.00	21,376.65	-	-	30,552.65	6,213.81		8,113.15	-	14,326.96
Total	26,099.83	72,043.13	572.76		98,715.72	22,257.62		27,011.73	329.56	49,598.91
										42,542.97
										18,602.65

*Including all local cooperative funds

a - Includes \$798.56 C.P.S. funds.

b - Includes \$5,523.49 Menominee Indian tribal funds.

OMNIBUS TABLE #1A SHEET #1

SUMMARY OF ALL RIBES ERADICATION 1918-1943 (INCLUSIVE)

Initial Eradication Work					Re-eradication Work								
State	Gross Acreage Reported Initially Worked	a	b	c	Number Wild and Cult. Ribes Destroyed	d	e	f	Net Acreage			j	
									Gross Acreage Reported Reworked	Re-Worked in Control Area			Number Wild and Cult. Ribes Destroyed
										First Rework	Other Reworkings		
Illinois	15,876			14,790	1,654,542		4,674	11,026	9,296	1,730	771,933	3,435	
Indiana	74,414			73,928	402,341		3,766	10,886	7,987	2,899	74,479	1,063	
Iowa	35,735			34,735	3,218,671		24,350	3,485	3,485	-	246,132	2,161	
Michigan	1,236,712			1,122,774	64,185,400		272,538	286,504	261,222	25,282	7,176,961	45,258	
Minnesota	407,112			384,070	58,900,528		149,898	112,466	100,731	11,735	7,099,285	35,693	
Ohio	192,169			185,020	2,512,625		32,471	37,588	28,704	8,884	820,005	10,187	
Wisconsin	1,001,650			940,450	84,494,024		345,846	261,130	251,634	9,496	6,484,748	48,216	
Total	2,963,668			2,755,767	215,368,131		833,543	723,085	663,059	60,026	22,673,548	146,013	

OMNIBUS TABLE #1A SHEET #2

SUMMARY OF ALL RIBIS ERADICATION 1918-1913 (INCLUSIVE)

State	Gross Initial and Reworked Acreage Reported	Initial and Re-eradication				Per Acre			
		Net Acreage		Number Ribes Destroyed		Number 8-flower Ribes-days	Ribes		Man-days Initial Re- eradication
		Initial	1st Rework	Other Reworking	Wild and Cult. only		Initial Re- erad. Ribes	Re-erad.	
Illinois	26,902	114,790	9,296	1,730	2,426,480	8,109	104.2	70.0	0.29
Indiana	85,300	73,928	7,987	2,899	1,76,820	4,829	5.4	6.8	0.05
Iowa	39,220	34,735	3,485	-	3,464,803	26,511	90.1	70.6	0.68
Michigan	1,523,216	1,122,774	261,222	25,282	71,362,361	317,796	51.9	25.0	0.22
Minnesota	519,578	381,070	100,751	11,735	65,999,813	185,591	114.7	63.1	0.37
Ohio	229,757	185,020	28,704	3,384	3,322,630	142,658	13.1	21.8	0.17
Wisconsin	1,262,780	940,450	251,634	9,496	90,978,772	394,062	84.4	24.3	0.35
Total	3,606,753	2,755,767	663,059	60,026	233,041,679	979,556	72.7	31.4	0.28

OMNIBUS TABLE #2A SHEET #1

STATUS OF BLISTER RUST CONTROL, 1918-1943, (INCLUSIVE)

State	Acreage of White Pine in Net Control Area	Acreage of Net Control Area (White Pine and Protection Zones)	Acreage of Net Control Area Initially Worked	Acreage of Net Control Area			Percentage Net Control Area Initially Worked	Acreage in Net Control Area Still Needing Initial Protection	Acreage in Net Control Area Now on Maintenance Basis*
				1st Rework	Reworked	Other Reworkings			
Illinois	3,508	28,441	14,790	9,296	1,730	52	33	13,651	1,387
Indiana	7,911	137,599	73,928	7,987	2,899	54	6	63,671	33,129
Iowa	5,000	60,000	34,735	3,485	-	58	6	25,265	10,774
Michigan	441,914	1,346,185	1,122,774	261,222	25,282	83	19	223,411	281,301
Minnesota	282,808	640,296	384,070	100,731	11,735	60	16	256,226	82,488
Ohio	35,713	448,822	185,020	28,704	8,884	41	6	263,802	53,388
Wisconsin	376,560	1,385,448	940,450	251,634	9,496	68	18	144,998	95,769
Total	1,153,444	4,046,791	2,755,767	663,059	60,026	68	24	1,291,024	558,736

*Maintenance - Any area on which the Ribes are so scarce that danger from blister rust is negligible for an indefinite period. To assure the continuation of this safe condition requires periodic examinations and in some instances Ribes eradication by scouting methods.

CONTINUED TABLE #3A SHEET #1

SUMMARY OF ALL RIBES EXTERMINATION BY PROGRAMS 1918-1943 (INCLUSIVE)

(Initial and Re-radiation)

State	Regular and Cooperative*			Emergency W.P.A. and E.R.A.		
	Acreage Worked	Number Wild and Cultivated Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Number Wild and Cultivated Ribes Destroyed	Number 8-Hour Man-days
Illinois	9,973	523,747	1,700	13,488	1,530,695	4,494
Indiana	25,664	56,794	407	40,091	304,357	2,659
Iowa	1,951	58,124	1,336	28,970	2,812,059	20,133
Michigan	170,591	3,552,410	16,696	790,281	42,485,225	172,756
Minnesota	35,353	1,725,602	12,117	299,591	38,241,993	97,104
Ohio	22,020	47,537	786	155,111	2,469,438	26,351
Wisconsin	192,221	6,374,593	24,523	652,781	45,423,736	193,258
Total	657,773	12,338,807	57,565	1,906,313	133,257,503	516,755

* This includes work of the Bureau, cooperating state and private agencies, Forest Service and Interior Department work with regular funds. This table recapitulates the totals in Table #1A Sheet #2.

OMNIBUS TABLE #3A SHEET #2

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1943 (INCLUSIVE)

(Initial and Re-eradication)

State	Emergency C.C.C., S.C.S. and C.P.S.				Emergency P.W.A. or N.R.A.				Total Emergency Program			
	Acreage Worked	Wild & Cultivated Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Wild & Cultivated Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Wild & Cultivated Ribes Destroyed	Number 8-Hour Man-days	Acreage Worked	Wild & Cultivated Ribes Destroyed	Number 8-Hour Man-days
Illinois	2,631	372,038	1,915	810	-	-	16,929	1,902,733	6,409			
Indiana	16,832	109,046	1,674	2,713	6,623	89	59,636	420,026	4,422			
Iowa	1,427	350,245	3,946	6,872	244,375	1,096	37,269	3,406,679	25,175			
Michigan	558,252	25,021,598	127,437	4,092	303,128	907	1,352,625	67,809,951	301,100			
Minnesota	142,279	20,989,656	65,922	42,355	5,042,562	10,448	484,225	64,274,211	173,474			
Ohio	41,234	683,419	13,823	11,392	132,236	1,693	207,737	3,285,093	41,872			
Wisconsin	407,086	38,128,709	174,236	4,692	1,051,734	2,045	1,070,559	84,604,179	369,539			
Total	1,169,741	85,654,711	388,958	72,926	6,780,658	16,278	3,228,980	225,702,872	921,991			

OMNIBUS TABLE #1A SHEET #1

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIPS 1918-1943 (INCLUSIVE)

Land Ownership	Not Control Area		Gross Acreage		Initial Eradication			
	a	b	c	d	e	f	g	h
National Forests		193,844	418,532	148,608	282,692	269,924	19,396,589	91,571
Other Public Domain		332	3,170	1,783	1,387	1,387	23,156	207
National Parks		-	-	-	-	-	-	-
Indian Reservations		50,262	37,241	20,345	79,815	76,696	27,358,230	70,807
Subtotal Federal		244,438	518,943	170,736	363,894	348,207	46,777,975	165,585
State & Private		908,976	3,527,848	1,120,238	2,599,774	2,407,560	168,590,156	667,958
Total		1,153,414	4,046,791	1,291,024	2,963,668	2,755,767	215,368,131	833,543

*Column d - column f equals column e. The total of column f of this table should agree with the total of column g of Table 1A Sheet #1.

OMNIBUS TABLE #4A SHEET #2

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIPS - 1918-1943 (INCLUSIVE)

Land Ownership	Re-eradication Work					Totals (Initial & Rework)					
	Gross Acreage Reported Reworked	Net Acreage Reworked in Control Area	Gross Number Wild & Cultivated Ribes Destroyed	Gross Number 8-Hour Man-days	Gross Initial and Reworked Acreage Reported	Net Acreage Initial and Rework			Gross Number Wild & Cultivated Ribes Destroyed		
						1st	Others	Initial Rework	Other	Ribes Destroyed	Man-days
Nat'l Forests	64,532	57,168	7,384	2,235,318	16,760	347,244	269,924	57,168	7,384	21,631,907	111,551
O&C Revested Lands	-	-	-	-	-	-	-	-	-	-	-
Other Public Domain	-	-	-	-	-	1,387	1,387	-	-	23,156	207
Nat'l Parks	-	-	-	-	-	-	-	-	-	-	-
Indian Reservation	46,657	43,697	2,940	4,311,979	23,323	126,452	76,896	43,697	2,940	31,670,209	54,130
Subtotal Federal	111,189	100,865	10,324	6,547,297	40,083	475,083	348,207	100,865	10,324	53,325,272	205,686
State & Private	611,396	562,194	49,702	16,126,251	105,930	3,211,670	2,407,560	562,194	49,702	134,716,407	773,688
Total	723,085	663,059	60,026	22,673,548	146,013	3,686,753	2,755,767	663,059	60,026	238,041,679	979,556

OMNIBUS TABLE #4A SHEET #5

SUMMARY OF RIBES ERADICATION ON INDIAN RESERVATIONS 1918-1943 (INCLUSIVE)

Indian Reservations (List separately)	Net Control Area			Initial Eradication Work				
	Acreage of White Pine in Net Control Area b	Total Acreage (W.P. & Prot. Zones)* c	Acreage Not Yet Worked Initially d	Gross Acreage Reported Initially Worked e	Net Acreage Worked In Control Area f	Gross Number Wild and Cultivated Ribes Destroyed g	Gross Number 8-Hour Man-days h	
Sac-Fox	45	500	294	206	206	2,980	58	
Grand Portage	361	432	-	587	432	739,562	1,074	
Nett Lake	6,041	8,538	1,684	6,937	6,904	516,195	1,489	
Red Lake	12,570	19,800	238	19,788	19,562	6,629,041	10,782	
Vermilion	72	186	-	286	186	137,530	424	
White Earth	495	1,163	-	1,354	1,163	398,705	1,178	
Bad River	6,331	16,974	9,509	7,919	7,465	7,360,760	16,126	
Lac Court Oreilles	2,436	7,859	359	7,989	7,500	1,008,704	7,063	
Lac du Flambeau	1,956	6,227	-	6,227	6,227	546,778	2,598	
Menominee	19,955	35,512	8,261	28,522	27,251	10,017,975	30,015	
Total	90,262	97,241	20,345	79,815	76,396	27,358,230	70,807	

*Column d and column f = column c.

SUMMARY OF RIBES ERADICATION ON INDIAN RESERVATIONS 1918-1943 (INCLUSIVE)

Indian Reservations (List Separately)	Re-eradication Work						Totals (Initial & Rework...)				
	Gross Acreage Reported Reworked	Net Acreage Reworked in Control Area		Gross No. Wild & Cultivated Ribes Destroyed		Gross Number 8-Hour Man-days	Gross Initial and Reworked		Gross No. Wild & Cultivated Ribes Destroyed		Gross Number 8-Hour Man-days
		1st	Others	1st	Others		Initial	Net Acreage Initial and Reworked	Initial	Other Re-work-ings	
Sao-Fox	-	-	-	-	-	-	206	-	206	-	58
Grand Portage	-	-	-	-	-	-	587	432	739,562	-	1,074
Nett Lake	3,057	3,057	-	101,741	-	664	9,994	6,904	3,057	-	2,153
Red Lake	16,360	14,752	1,608	1,718,929	-	7,247	36,148	19,562	14,752	1,608	18,029
Vermilion	392	206	186	58,771	-	445	678	186	206	186	869
White Earth	377	372	5	45,226	-	257	1,731	1,163	372	5	1,435
Bad River	4,450	4,450	-	678,944	-	2,780	12,369	7,465	4,450	-	18,906
Lac Court Oreilles	3,428	3,428	-	131,865	-	991	11,417	7,500	3,428	-	8,054
Lac du Flambeau	5,585	5,585	-	19,614	-	189	11,812	6,227	5,585	-	2,787
Menominee	12,988	11,847	1,141	1,556,889	-	10,750	41,510	27,251	11,847	1,141	40,765
Total	46,637	43,697	2,940	4,311,973	-	23,323	126,452	75,895	43,697	2,940	94,130

COMBOS TABLE 1A SHEET #7

SUMMARY OF REES ERADICATION ON STATE AND PRIVATE LANDS 1918-1943 (IMMUNITIVE)

State and Private Lands (List by States)	Net Control Area			Initial Eradication Work			
	Acreage of White Pine in Net Control Area (b)	Total Acreage* (M.P. & Prot. Zones) (c)	Acreage Not Yet Worked Initially (d)	Gross Acreage Reported Initially Marked (e)	Net Acreage Worked in Control Area (f)	Gross Number Wild & Cultivated Fibers Destroyed (g)	Gross Number 8-Hour Man-days (h)
Illinois	3,508	28,441	13,651	15,876	14,790	1,654,542	4,674
Indiana	7,824	137,060	63,132	74,414	73,923	402,341	3,768
Iowa	4,555	59,500	24,971	35,529	34,529	3,215,691	24,292
Michigan	390,538	1,204,841	210,786	1,098,487	994,055	53,684,630	244,399
Minnesota	149,892	408,561	128,679	300,278	279,882	41,403,459	98,236
Ohio	34,895	442,054	260,219	188,984	181,835	2,489,413	32,251
Wisconsin	317,314	1,247,391	418,350	536,206	823,541	60,740,020	260,340
Total	908,976	5,527,343	1,120,288	2,593,774	2,407,560	168,590,156	647,958

*Column c = Column d and column f.

OMNIBUS TABLE #1A SHEET #8

SUMMARY OF RIBES ERADICATION ON STATE AND PRIVATE LANDS 1918-1943 (INCLUSIVE)

State and Private Lands (List by State)	Reeradication Work						Totals (Initial and Rework)				
	Gross Acreage Reported	Net Acreage Reworked in Control Area	Gross Number Wild and Cultivated Ribes Destroyed	Gross Number 8-Hour Man-days	Gross Initial and Reworked Acreage Reported		Initial Rework	Initial and Rework	Gross Number Wild and Cultivated Ribes Destroyed		
					1st	Others			1st	Other	
											8-Hour Man-days
Illinois	11,026	9,296	1,730	771,938	3,435	26,902	14,790	9,296	1,730	2,426,480	8,109
Indiana	10,886	7,987	2,899	74,479	1,063	85,300	73,928	7,987	2,899	476,820	4,829
Iowa	3,485	3,485	-	246,132	2,161	39,014	34,529	3,485	-	3,461,823	26,453
Michigan	264,917	239,635	25,282	6,545,154	40,527	1,363,404	994,055	239,635	25,282	65,229,844	284,926
Minnesota	53,171	60,619	2,552	3,962,804	18,752	363,449	279,882	60,619	2,552	45,366,263	116,988
Ohio	37,588	28,704	8,884	820,005	10,187	226,572	181,835	28,704	8,884	3,309,418	42,438
Wisconsin	220,823	212,468	8,355	3,705,739	29,805	1,107,029	828,541	212,468	8,355	64,445,759	290,145
Total	611,896	562,194	49,702	16,126,251	105,930	3,211,670	2,407,560	562,194	49,702	184,716,407	773,888

OMNIBUS TABLE #1A SHEET #9

SUMMARY OF RIBES ERADICATION ON NATIONAL FORESTS 1918-1943 (INCLUSIVE)

National Forests (List by forests or Regions)	Net Control Area				Initial Eradication Work			
	Acreage of White Pine in Net Control Area b	Total Acreage* (W.P. & Prot. Zones) c	Acreage not yet Worked Initially d	Gross Acreage Reported Initially Worked e	Net Acreage Worked in Control Area f	Gross Number		
						Wild and Cultivated Ribes Destroyed g	Gross Number R. Bear Man-lays h	
Manitoba	20,536	64,970	-	65,312	64,970	150,364	1,355	
Buron	1,424	5,452	-	5,236	5,452	64,475	504	
Marquette	10,691	25,299	4,250	22,672	21,049	830,386	7,059	
Hinewatha	6,932	20,879	3,030	20,170	17,849	628,477	4,810	
Ottawa	11,743	24,744	5,345	24,835	19,399	3,827,008	14,111	
Superior	89,109	150,318	110,099	38,811	40,219	5,693,764	22,605	
Chippewa	24,268	51,248	15,526	39,071	35,722	3,382,272	14,110	
Wayne	503	3,746	1,948	1,798	1,798	56	13	
Chequamegon	16,508	41,265	3,621	37,754	37,644	2,615,833	16,223	
Micolet	12,060	30,220	4,398	27,033	25,822	2,203,954	13,181	
Hoodier	70	391	391	-	-	-	-	
Total	193,844	413,532	148,608	282,692	269,924	19,386,809	94,571	

*Column c equals Column d and Column f.

OMNIBUS TABLE #4A SHEET #10

SUMMARY OF RIBES ERADICATION ON NATION FORESTS 1918-1943 (INCLUSIVE)

National Forests (List by Forests or Regions)	Re-eradication Work						Totals (Initial and Rework)				
	Gross Acreage Reported Reworked	Net Acreage Reworked in Control Area	Gross Number		Gross 8-Hour Man-days	Initial and Reworked Acreage Reported	Net Acreage Initial Rework Reworkings	Other 1st	Wild and Cultivated Ribes Destroyed	Gross Number 8-Hour Man-days	
			Gross Acreage Reported	Gross Acreage Reworked							
Manistee	8,779	8,779	-	7,658	103	74,091	64,970	8,779	-	158,022	1,458
Huron	766	766	-	23,455	134	6,002	5,452	766	-	87,930	638
Marquette	1,170	1,170	-	26,070	717	23,842	21,049	1,170	-	856,456	7,776
Hiawatha	3,874	3,874	-	52,604	645	24,044	17,849	3,874	-	681,081	5,455
Ottawa	6,998	6,998	-	522,020	3,132	31,833	19,399	6,998	-	4,349,028	17,543
Superior	19,686	13,321	6,365	1,038,425	7,138	58,497	40,219	13,321	6,365	6,732,189	29,743
Chippewa	9,425	8,404	1,019	173,389	1,190	48,494	35,722	8,404	1,019	3,555,661	25,300
Wayne	-	-	-	-	-	1,798	1,798	-	-	56	13
Chequamegon	7,138	7,138	-	197,130	1,736	44,892	37,644	7,138	-	2,812,963	17,959
Micoret	6,718	6,718	-	194,567	1,965	33,751	25,822	6,718	-	2,398,521	15,446
Hoosier	-	-	-	-	-	-	-	-	-	-	-
Total	64,552	57,163	7,384	2,235,318	16,760	347,244	289,924	57,168	7,384	21,631,907	111,391

ODONTUS TABLE #5A SHEET #1

SUMMARY OF ALL OTHER CONTROL WORK 1918-1943 (INCLUSIVE)

Cultivated Black Currant Eradication											
State	Number Inspections Made	Number Locations Found	Number Black Currants Destroyed	Number 8-Hour Man-days	Number of Nurseries			Nursery Sanitation			
					Sanitation Zone Maintained	Sanitation Zone Abandoned	Number Acres Forfeited	Which Nurseries Abandoned	Total Acreage	Number Wild and Cultivated Ribes Destroyed	Number 8-Hour Man-days
Illinois	48,067	532	564a	65	8	0	4,330	0	4,330	50,346	359
Indiana	64,226	5	15	163	3	3	1,650	2,100	3,750	11,351	57
Iowa	317,976	1,588	6,942	6,496	7	2	2,156	910	3,066	65,445	750
Michigan	980,633	14,926	143,700	39,599	9	4	2,524	2,162	4,686	1,110,734	16,255
Minnesota	211,664	3,260	23,306	12,001	9	8	3,918	1,886	5,804	1,324,720	5,010
Ohio	1,845,970	8,838	73,117	25,791	4	9	1,624	4,507	6,131	59,551	1,881
Wisconsin	922,898	6,601	37,051	32,137	11	6	2,760	2,225	4,985	878,727	8,136
Total	4,371,434	35,750	284,695	116,252	51	32	18,962	13,790	32,752	5,500,874	52,148

a - 97 C.B.C. destroyed in connection with nursery sanitation and local control not included here.

OMNIBUS TABLE #5A SHEET #2

SUMMARY OF ALL OTHER CONTROL WORK 1918-1943 (INCLUSIVE)

Mapping Control Areas				Treatment of Infected White Pines				
State	Number Acres Mapped (White Pine and Protection Zones)	Number 8-Hour Man-days	Total Number Pines Examined	Number Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	Number Cankers Removed		Number 8-Hour Man-days
						Branch	Stem	
Illinois	26,175	285	-	-	-	-	-	-
Indiana	120,139	308	-	-	-	-	-	-
Iowa	48,465	5,253	-	-	-	-	-	-
Michigan	1,767,139	17,658	703,045	291	38,117	94,000	327	3,063
Minnesota	741,968	34,038	225,252	1,199	9,152	29,749	240	1,051
Ohio	351,199	3,389	1,305	13	43	114	11	15
Wisconsin	1,369,717	20,946	-	-	-	-	-	-
Total	4,424,802	81,877	929,602	1,503	47,312	123,863	578	4,129

OMNIBUS TABLE #6A SHEET #1

SUMMARY OF ALL EXPENDITURES, 1918-1943 (INCLUSIVE) INCLUDING MILWAUKEE OFFICE COSTS PRORATED TO STATES

Federal (All Agencies Including State WPA Projects)	State (Including All Coop. Funds)		Recapitulation of Regular Funds				
	Indirect Aid	Direct Aid (Ribes Erad.)	Grand Total (State and Federal Funds)	B.P.I. and B.E.P.Q.	Forest Service	Dept. of	
						Interior Indian Lands	
Total	Total	Total	Total	Total	Total	Total	
Illinois	\$42,904.20	\$19,337.95	\$7,521.67	\$69,763.82	\$12,943.39	\$12,943.39	
Indiana	24,211.81	3,433.10	1,441.78	29,086.69	3,285.45	3,285.45	
Iowa	210,330.32	17,904.00	11,771.95	240,006.27	36,662.26	36,662.26	
Michigan	1,457,854.40	113,839.50	105,157.78	1,676,851.68	176,232.53	186,732.21	
Minnesota	1,212,064.72	93,699.19	27,909.00	1,333,672.91	186,150.96	242,185.16	
Ohio	376,868.18	22,096.13	25,258.19	424,222.50	49,291.12	49,291.12	
Wisconsin	1,709,814.85	79,066.03	113,547.41	1,902,428.29	181,616.43	215,977.10	
Total	5,034,048.48	349,375.90	292,607.78	5,676,032.16	646,182.14	747,076.69	

SUMMARY OF ALL EXPENDITURES, 1918-1943 (INCLUSIVE) INCLUDING MILWAUKEE OFFICE COSTS PRORATED TO STATES

Recapitulation of Emergency Funds					
Federal W.P.A.			C.C.C. and S.C.S.		
State	Bureau	Forest Service	Dept. Interior	State WPA (All Bureau)	Forest Service & State Camps
Illinois	\$22,920.30	-	-	-	-
Indiana	15,473.62	-	-	-	\$3,612.95
Iowa	127,901.67	-	-	\$12,828.57	13,551.28
Michigan	769,231.63	\$7,747.62	\$1,832.99	83,544.94	292,733.73
Minnesota	631,677.41	1,518.84	-	48,945.50	126,442.27
Ohio	109,430.99	-	-	160,033.62	33,819.51
Wisconsin	779,095.52	8,797.45	-	7,737.61	379,820.20
Total	2,455,731.14	18,063.91	1,832.99	313,090.24	849,979.94
					286,623.36
					1,136,603.30

Recapitulation of Emergency Funds (Continued)					
P.W.A.			CWA, ARA, ERA, NYA, C.P.S. Camps		
State	Bureau	Forest Service	Total	Total	Grand Total
Illinois	\$2,306.32	-	\$2,306.32	\$771.33	\$29,960.81
Indiana	1,839.79	-	1,839.79	-	20,926.36
Iowa	12,971.11	-	12,971.11	4,858.23	173,668.06
Michigan	72,161.63	\$1,184.10	73,345.73	33,714.86	1,271,122.19
Minnesota	67,900.24	6,181.97	74,082.21	2,280.34	969,879.56
Ohio	19,199.09	-	19,199.09	5,093.85	327,577.06
Wisconsin	57,198.42	1,036.16	58,234.58	72,952.77	1,493,837.75
Total	233,576.60	8,402.23	241,978.83	119,671.38	4,286,971.79

